

A RECLASSIFICATION OF
THE TRIBE MICROGASTERINI
(HYMENOPTERA : BRACONIDAE)



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SYNOPSIS

The subfamily Microgasterinae is taken as being composed of two tribes, the Cardiochilini and the Microgasterini, together with a few isolated genera. Apart from a brief initial discussion of the isolated genera, the work is devoted to a study of the Microgasterini. This tribe is keyed to generic level with the inclusion of 8 new genera. The largest genus, *Apanteles*, is broken down into 44 species-groups, of which 19 are worked out to species-level. *Microgaster* of authors is divided into several genera, of which three have been lifted out of synonymy. The *Microgaster*-group of genera has received a treatment similar to that of *Apanteles*, the largest of them, *Protomicroplitis*, being split into 20 species-groups, of which 10 are keyed to species. Altogether, 360 species are dealt with.

INTRODUCTION AND ACKNOWLEDGEMENTS

BECAUSE of their economic significance and the frequency with which they are bred from their lepidopterous hosts, the Microgasterinae have come to occupy a somewhat special position among the Braconidae. It cannot be said, however, that their classification has ever been sufficiently stable to accommodate the many hundreds of species that have been described. The weight of information concerning a new species has thus tended to shift onto knowledge of its host rather than rest securely on an awareness of what characterises the species as morphologically distinct.

This weakness was recognised by the late D. S. Wilkinson as is amply shown by the painstaking papers he published with great frequency between 1927 and 1941. The most ambitious of these were his "Revision of the Ethiopian species of *Apanteles*" which appeared in 1932 and the posthumous "Palearctic species of *Apanteles*", published in 1945.

The former of these two works is important for it embodied Wilkinson's ideas on how best the genus *Apanteles* could be subdivided for the practical purpose of finding

within its wide limits an appropriate place for the new species that passed constantly into his hands. The later monograph comprises as much as he was able to finish of his project to revise the *Apanteles* of the Palearctic region.

More recent contributions have been provided by de Saeger (1944) who worked out the Microgasterinae of the Belgian Congo, Granger (1949) who included a revision of the Microgasterinae in his work on the Braconidae of Madagascar and Telenga (1955), who has monographed the group for the U.S.S.R.

In N. America, Muesebeck has been responsible for nearly all the work that has been done on the Microgasterinae and his two major revisions (1920 and 1922) have not been superseded.

The above writers have provided the main sources from which I have culled information concerning the traditional classification of the Microgasterinae. As for the actual material on which this revision is based, I have had at my disposal the very large amount of material accumulated by Wilkinson and received by him from almost every part of the world. I have also had the added advantage of being able to study the various rich collections of Microgasterinae that have been acquired by the British Museum from various sources. And last, but by no means least, I have been immensely helped in formulating ideas about the classification of these parasites by the fine collection of Microgasterinae made by C. F. Baker in the Philippines and lent to me by the authorities of the U.S. National Museum who, in forbearing to reclaim a loan of many years' standing, have shown a patience and understanding of which I am deeply appreciative.

In addition, various entomologists have helped me. I express special thanks to Dr. C. F. W. Muesebeck of the Bureau of Entomology, U.S. National Museum for much kind help and to Mr. R. L. E. Ford for his persistence in trying to secure for me series of rare or little known species from Great Britain, by breeding them from their hosts.

Others who earn my sincere thanks are : Dr. Max Fischer (Naturhistorisches Museum, Vienna) ; Dr. Ch. Granger ; Dr. Wolter Hellén (Helsinki Museum) ; Dr. E. Papp (Bakonyi Museum, Veszprém) ; Dr. H. K. Townes.

Finally, a few words are necessary about the treatment of species. For some genera and groups of species within genera, all information about the species is given within an extended key. But in my treatment of the *ater*-group of *Apanteles* and a few other groups, most of the information is given in the text, separately from the key.

All the drawings were done by me ; they are intended to be used comparatively and without their help not much progress is likely to be made through the keys.

TERMINOLOGY

In describing the various veins and cells of the wings I have followed Rohwer and Gahan (1916). Their system has been used extensively by workers on parasitic Hymenoptera, although it finds little support in more recent studies on the homologies of the insect wing. Unfortunately, the Rohwer-Gahan system, itself an attempt to stabilise what was most useful in the original Jurinean system, has not

always been consistently applied and confusion has arisen over the application of some of the terms.

The reader is referred to Text-fig. 1 for an explanation of the wing terminology used in this work ; the modern notation is added in brackets.

The antenna is considered to consist of three parts:— *scape*, *pedicel* and *flagellum*.

A few further terms that perhaps need defining are the following:—

areola ; the enclosed median field of the propodeum and a typical feature of the *ater*- and *ultor*-groups of *Apanteles*.

areolet ; the small 2nd cubital cell (1R_s) of the typical microgasterinae fore wing ; open distally (*Apanteles*) or closed by the 2nd transverse cubital vein (2r-m) (most other genera).

costula ; the short, transverse keel that extends outwards from the lateral angle of the areola towards the propodeal spiracle.

hypopygium ; the large, apical ventrite of the female.

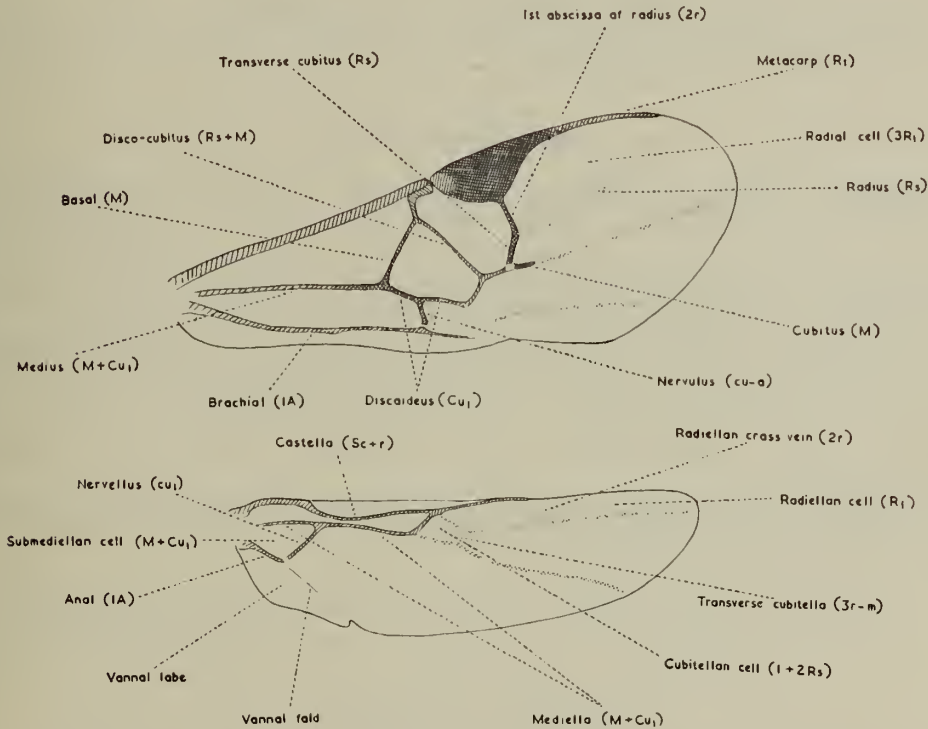


FIG. 1. *Apanteles carpatus* (Say), wings and terminology of wings.

THE SUBFAMILY MICROGASTERINAE

Telenga (1955), the most recent worker on the subfamily, divides it into three tribes :—Microgasterini, Cardiochilini and Acoeliini.

The Microgasterini, limited by Telenga to *Apanteles*, *Microgaster*, *Microplitis* and *Hygroplitis* is almost exactly coextensive with the tribe as I have interpreted it in this work.

Telenga's Cardiochilini contains the two genera, *Cardiochiles* Nees and *Asio-cardiochiles* Telenga. The subfamily Cardiochilinae is reduced to the status of a tribe but its content, though a little smaller, remains unchanged.

Szepligeti (1904) included in the Cardiochilinae only three genera : *Cardiochiles* Nees, *Toxoneuron* Say and *Psilophthalmus* Szepligeti. *Toxoneuron*, along with several other genera either unknown to Szepligeti or described after the appearance of the Genera Insectorum, has been sunk as a synonym of *Cardiochiles* by Muesebeck and Walkley (1951). *Psilophthalmus*, which I know from a single specimen (unnamed) from Peru and identified by Mrs. J. Clark in the British Museum (Natural History), is certainly close to *Cardiochiles*, though showing several uncharacteristic features.

I think Telenga is right in stressing the affinity of *Cardiochiles* s.l. with the Microgasterini by means of the tribal concept.

Telenga's Acoelinii is the least natural of the three tribes and is made up of the four genera, *Mirax* Haliday, *Myriola* Shestakov, *Dirrhope* Förster and *Adelius* Haliday.

All these genera are discussed below.

APANTELES Förster

Muesebeck (1920 : 485) expressed the belief that *Apanteles* was a homogeneous group and not susceptible of division into smaller units. He therefore placed in synonymy all the genera into which Ashmead and Viereck had attempted to break up the genus. These genera have remained in disuse ever since. Nor has Muesebeck in any of his more recent papers on *Apanteles* modified his earlier opinion.

Wilkinson (1932) divided *Apanteles* into five groups that he arbitrarily designated with the letters, A, F, S, U and M. The first four of these, as he himself admits, were essentially extensions of the four sections proposed by Marshall in 1885 for the British species. Later, Wilkinson (1934 : 155) added a sixth group to which he gave the letter G.

Wilkinson's subdivisions were used by de Saeger (1944) and Granger (1949) but not by Telenga who, nevertheless, could not avoid using the fundamental characters on which the subdivisions are based.

Of Wilkinson's groups, A and F represent for the most part natural aggregates. The others are too artificial to have taxonomic value. Group S, which Wilkinson reserved for all species having a propodeal areola, can be split into two main divisions that are convergent in that they both possess this areola or at least a vestige of it. In other respects they are widely dissimilar on a combination of characters, of which one, the shape of the vannal lobe of the hind wing, is striking and probably of philogenetic significance. This character, incidentally, is perhaps the most useful I have been

able to find in my search for a means of dividing *Apanteles* into smaller units.

Making the fullest use of the few characters offered by *Apanteles*, so far as I have been able to discover them, I have subdivided the genus into 44 species-groups. Some of these such as the *glomeratus*-group (virtually coextensive with Wilkinson's group F) are very large ; many others consist of less than half a dozen species, while several are based on a single species. These groups have, I believe, a certain homogeneity. Nevertheless, and although they emerge from an investigation of many hundreds of species from all parts of the world, they still lack that sharpness of definition that would justify generic status.

In spite of what I have just said, I am convinced that if ever so large and unwieldy a genus as *Apanteles* is going to be handled satisfactorily, a basis for generic cleavages will have to be found. The generic names exist and need only to be lifted out of synonymy. Their application, however, will require an investigation that explores more widely and deeply the world fauna than this one of mine does.

In the meantime, by making use of the species-group concept and by fully exploiting the range of structural patterns occurring within *Apanteles*, I have suggested the lines along which further investigation can, I believe, proceed.

MICROGASTER Latreille of authors

Microgaster, separated from *Microplitis*, as it has been, solely on the length of the inner spur of the hind tibia, is even more amorphous than *Apanteles*. The conclusion is inescapable that among the species lumped together in *Microgaster*, there are several evolutionary lines of descent. This is even more obvious than in *Apanteles*, partly because "*Microgaster*" species tend to be larger than species of *Apanteles*, their characters are better seen and morphological divergence seems to be sharper and more striking.

I have found it expedient to take out of synonymy the genera *Hypomicrogaster* Ashmead, *Protomicroplitis* Ashmead and *Xanthomicrogaster* Cameron and to restrict drastically the concept of *Microgaster* Latreille itself. I have also made a few genera to accommodate known species already described in *Microgaster* and a few new species that would certainly have been covered by the older interpretation of the genus.

Of the above genera, *Protomicroplitis* is by far the largest, and is abundantly represented throughout the tropics of the Old and New World. I have subdivided it into several species-groups, some of the smaller of which I have worked out to species level.

Microgaster, as subsequently redefined, is chiefly confined to the temperate regions of the Northern Hemisphere.

MICROPLITIS Förster

This, the third of the three traditional microgasterine genera, is in my opinion, the most homogeneous of them all. I have associated with it two new genera, one of

which is certainly artificial though based on a striking character while the other seems to be transitional towards the polyphyletic *Microgaster* s.l.

Snellenius Westwood, for all its bizarre appearance, represents only an extreme development of *Microplitis*.

I have made no attempt to subdivide *Microplitis* into species-groups though this will need to be done eventually.

MIRAX Haliday

The position of this genus is doubtful but there is some justification, I think, for the suggestion put forward by my colleague, Dr. J. F. Perkins, that it could be regarded as the basic member of an independent tribe within the Microgasterinae, of world-wide distribution and containing a few closely related genera.

The British Museum contains *Mirax* from all parts of the world, especially S. Africa and Brazil. I have examined these specimens and recognised several distinct species among them.

The species of *Mirax* show a remarkable uniformity in wing venation ; indeed, there is little departure from the pattern shown in Text-fig. 4. Variation occurs in the degree to which the stigma may be prolonged distally. When the distal narrowing is pronounced, the tip of the stigma tends to be more weakly pigmented than elsewhere. A differentiated metacarp is never present.

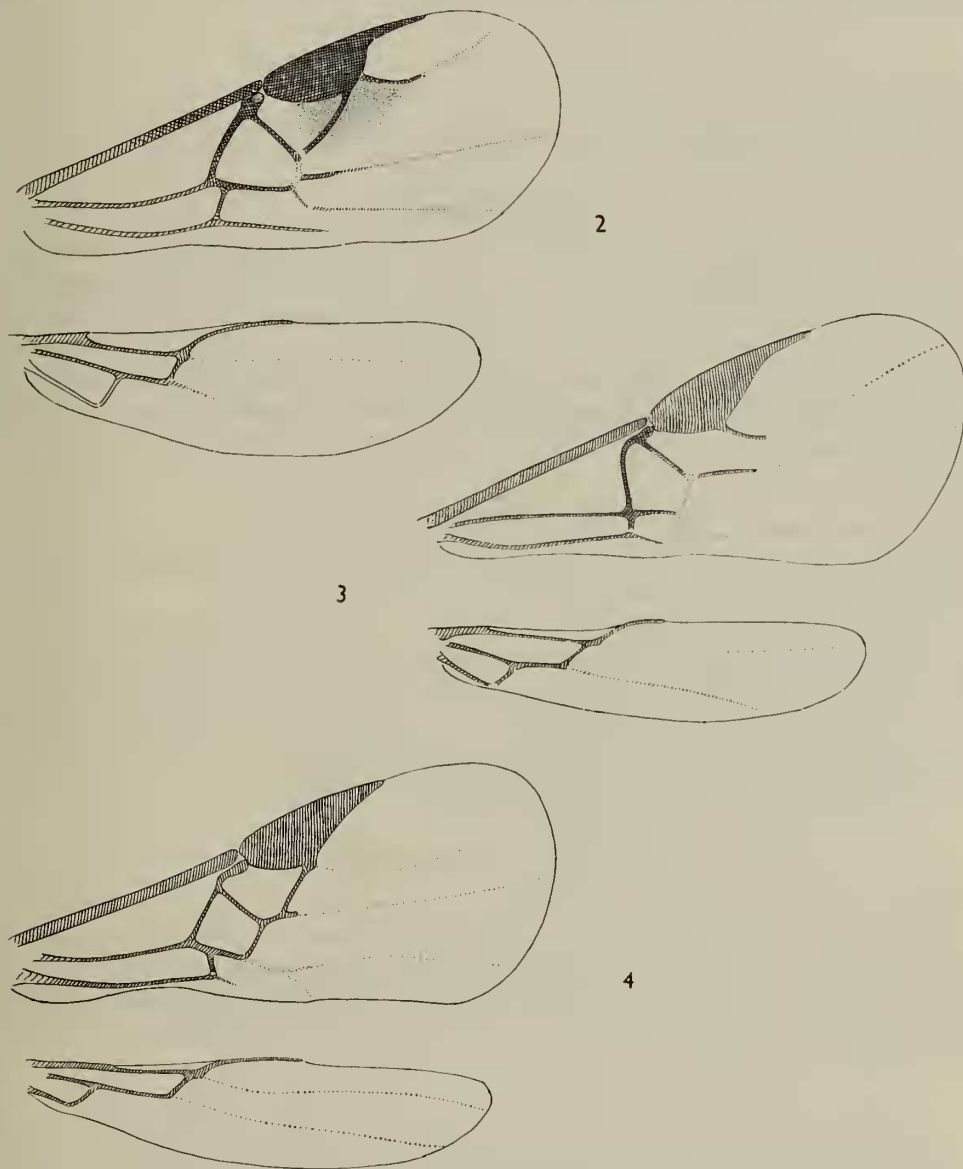
In common with the Microgasterini, *Mirax* has the spiracles of the first tergite situated on the lateral, membranous part of the segment, remote from the more heavily sclerotised, median plate.

ADELIUS Haliday = **ACOELIUS** auctt.

This genus has no obvious relationship with *Mirax* nor, in my opinion, has it any clear affinity with the Microgasterini, even at tribal level. Perkins has suggested that *Adelius* may be related to the Cheloninae, a view to which I give my support. Against it, of course, is the striking difference between the gaster of *Adelius* and that of the typical Cheloninae. The type-species, *subfasciatus* Haliday, is remarkable in having the gaster smooth, polished and with no obvious suture between tergites 1 and (2 + 3). But there exist in the British Museum a few apparently undescribed S. African species, about whose affinity with *Adelius* there can be no question at all but in which tergites 1 and (2 + 3) have become entirely rugose and separated by a well marked suture. I regard these species as belonging to de Saeger's *Paradelius*. In another unnamed S. African species, tergite (2 + 3) has become even more sculptured and lengthened and divided into its two component parts by a second rugose suture. The gaster in this species presents a strongly sclerotised carapace with two rugose sutures and concealing all the segments posterior to tergite (2 + 3). The gaster thus comes to have a deceptive resemblance to that commonly found in some of the genera of the Triaspidini (now in Blacinae, Muesebeck and Walkley, 1951).

As a source of systematic affinities the gaster is notoriously unreliable and in almost all the subfamilies of the Braconidae it is possible to find examples in which tergites 1 and (2 + 3) have become fused, enlarged and heavily, rugosely sculptured.

I have not made an exhaustive comparison of *Adelius* with the Cheloninae but apart from subtle resemblances in facies, not easily put into words, *Adelius* has the



FIGS. 2-4. Wings, ♀: 2, *Adelius subfasciatus* Haliday; 3, *Paroligoneurus* sp., near *wittei* de Saeger; 4, *Mirax leucopterae* Wilkinson.

following chelonine features :—a long, bent scape ; the flagellum, at least in the female, thickened in the middle ; the hind femur swollen and with a somewhat abrupt basal constriction.

In the few *Adelius-Paradelius* species referred to above, the venation has remained remarkably constant, except that in the species showing the highly modified, Triaspidini-like gaster, the metacarp is absent.

MYRIOLA Shestakov

Shestakov, 1932, *Zool. Anz.*, **99** : 259.

Synonymised under *Adelius* Haliday by Muesebeck and Walkley (1951).

DIRRHOPE Förster

Muesebeck (1935) considers this genus to be correctly placed in the Microgasterinae though he does not state how it stands in relation to the other genera.

I have discovered amongst the British Museum accessions three specimens from S. Africa that agree well with Muesebeck's generic description and also his figure of *Dirrhope americana* Mues. Frankly, I am unable to express a definite opinion about the position of this genus in its relationship with the other microgasterine genera and do no more than point to some of its more salient features in the key that follows later.

PAROLIGONEURUS Muesebeck

Muesebeck (1951) includes this genus in the Microgasterinae and in so doing confirms the opinion he expressed when he described it in 1931.

It seems to me that *Paroligoneurus*, like *Mirax*, covers at present a closely knit group of species, among which generic splits may later be found to be feasible. I have examined some half dozen species from S. Africa, Brazil and Queensland and found a remarkable uniformity of structure. The venation conforms closely to that shown in Text-fig. 3 ; a curious and characteristic feature of it is the costad bend in the basal vein just before its junction with the prostigma.

OLIGONEURUS Szepligeti

Szepligeti, 1902, *Természeti. Fuz.* **25** : 77.

This genus is based on a Brazilian species and little can be said about it until the type is examined. Muesebeck (1922) included it in the Microgasterinae, giving a translation of the original description. It seems reasonable to conclude that the genus is related to *Paroligoneurus*, differing from it in having hairy eyes (teste Muesebeck).

THE LIMITS OF THE SUBFAMILY MICROGASTERINAE

The observations and opinions expressed above concerning the genera traditionally accepted as belonging to the Microgasterinae reflect in some measure my own views on how the subfamily should be composed.

I consider that the Microgasterinae would be better restricted to the two tribes Microgasterini and Cardiochilini together with the genus *Mirax* which, as stated earlier on, might with justification be given tribal status. These three segregates have one important feature in common: the spiracle of the first tergite is situated on the lateral, membranous part of the tergite, remote from the sclerotised, median plate. It needs to be stressed, however, that otherwise no special resemblances unite them. Each, too, is sharply distinct from the others; nor, as far as I am aware, do they converge at any point.

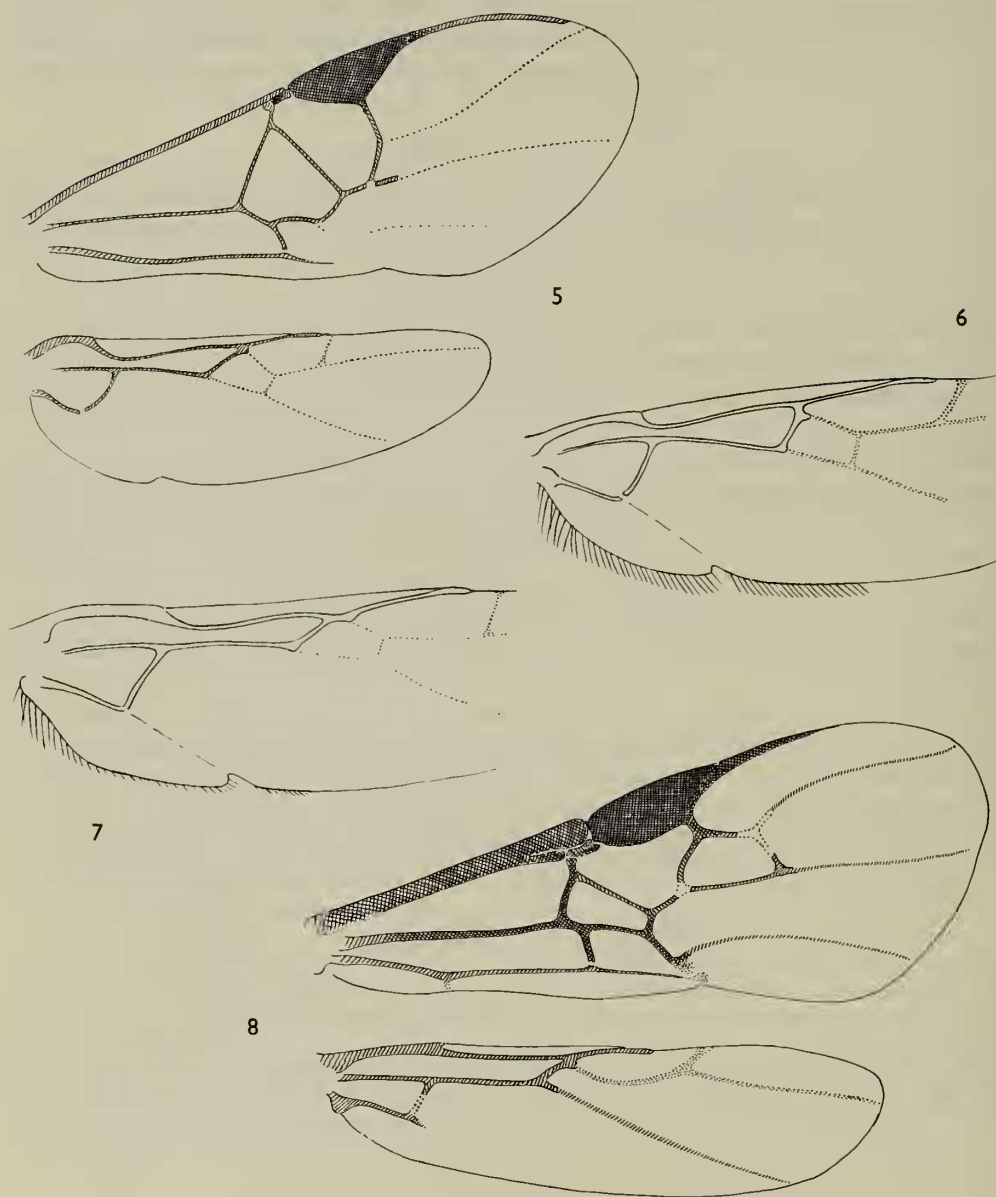
The tribe Microgasterini, numerically vastly superior to the Cardiochilini and *Mirax*, is remarkably homogeneous. Its two special features—the closed cubitellian cell and differentiated vannal lobe of the hind wing—remain constant throughout almost its entire range and, in combination with the spiracle of the first tergite, provide the essential characteristics of the tribe, and indeed of the subfamily Microgasterinae, since in my opinion the two are virtually synonymous.

The Acoelinii as represented by *Adelius* and *Paradelius* could form more fittingly a tribe within the Cheloninae. This tribe shows no close relationship with any of the Microgasterini genera.

Paroligoneurus resembles the Microgasterini only in having a reduced venation, though the reduction is not homologous in the two segregates. The finding of a new place for this genus outside the Microgasterinae and the possible raising of its status belong to the wider problem of revising the major classification of the Braconidae. Such a task will involve a survey of the world fauna, for it is ingenuous to expect that the existing subfamilies, based entirely on species of the North temperate region, can cover the enormous range of structure now known to exist within tropical Braconidae.

KEY TO GENERA AND TRIBES OF THE MICROGASTERINAE

- 1 Three cubital cells present, the 2nd always much longer than wide, the 2nd abscissa of the radius being always much longer than the 1st (Text-fig. 8); antenna with at least 26 segments; notaulices always well developed.
 Spiracle of the 1st tergite situated on the latero-tergite, as in the Microgasterini; a sharply discrete, more heavily sclerotised, median plate, such as occurs in this tribe, rarely developed; 3rd abscissa of the radius at base characteristically concave towards the wing-edge; inner spur of the hind tibia always longer than the length of the hind basitarsus **CARDIOCHILINI** s. str.
- Rarely three cubital cells present and the 2nd always very small (areolet of the Microgasterini), not longer than wide, the 2nd abscissa of the radius not longer than the 1st; notaulices rarely developed and then the antenna with not more than 18 segments 2
- 2 Hind wing with a cubitellian cell that is closed distally by a spurious vein (Text-fig. 5), (the Australian *Micropotes* and the S. African *Semionis* are exceptions); hind wing with a differentiated vannal lobe, limited distally by a notch, (the monobasic Brazilian *Larissimus* and *Prasmodon* are exceptions); vannal fold at least twice as long as the anal vein lying along it; external, distal corner of the submediellian cell of the hind wing always remote from the edge of the wing; 2nd cubital cell (areolet) either open or closed distally, but always small, the 2nd abscissa of the radius never longer than the 1st; spiracle of the 1st tergite always situated on the latero-tergite, remote from the more heavily sclerotised, median plate; antenna always with 18 segments **MICROGASTERINI**



FIGS. 5-8. Wings, ♀: 5, *Apanteles ultor* Reinhard; 6, *Protomicroplitis marginatus* (Nees); 7, *Protomicroplitis basimacula* (Cameron); 8, *Cardiochiles saltator* (F.)

- Hind wing without a closed cubital cell and without a differentiated vannal lobe ; external, distal corner of the submediellian cell always close to the edge of the wing ; 2nd cubital cell, if present, never in the form of a small areolet.
2nd transverse cubital vein always absent 3
- 3 Both transverse cubital veins wanting ; basal vein strongly curved just before its junction with the prostigma.
Tergite I with a heavily sclerotised, median plate, its spiracle set in a small prominence on the lateral edge of this plate ; hind spurs extremely short, the inner one from one fifth to one quarter as long as the hind basitarsus ; a short metacarp either absent or present ; propodeum smooth ; pedicel equal to fully half the length of the scape (much as in *Mirax*) ; no percurrent flange beneath the hind basitarsus, such as occurs in the Microgasterini **PAROLIGONEURUS** Muesebeck
- 1st transverse cubital vein present ; basal vein without this conspicuous bend 4
- 4 1st transverse cubital vein joined with the radius and cutting off a well defined 1st radial abscissa (the usual condition of the generalised braconid wing).
Scape rather long, fully twice as long as the pedicel ; propleurum laterally with a flange that overlaps the lateral edge of the pronotum ; propodeum completely areolated and with seven discrete fields ; prepectus margined, at least laterally ; inner spur of the hind tibia reaching beyond middle of hind basitarsus ; hind basitarsus with percurrent flange beneath ; tergite I with oblong, median, heavily sclerotised plate, on extreme edge of which is situated the spiracle (cf. *Mirax*).
DIRRHOPHE Förster
- 1st transverse cubital vein joined or almost joined with the stigma ; hence, not cutting off a clearly defined 1st radial abscissa 5
- 5 Antenna 14-segmented ; pedicel long in proportion to length of scape, fully two thirds as long ; occiput not margined ; tergite I with strongly sclerotised, discrete median plate (as in the Microgasterini) ; spiracle of 1st tergite situated on the latero-tergite, remote from the median plate ; hind spurs very short, the inner one not reaching to middle of the hind basitarsus ; fore wing without metacarp, at most the stigma somewhat prolonged distally (Text-fig. 4) ; hind tibia not swollen and not characteristically club-shaped **MIRAX** Haliday
- Antenna 20-segmented ; pedicel short in proportion to length of scape ; scape unusually long ; occiput margined ; tergite I without a discrete median plate ; the posterior margin of this tergite either not defined or defined by a curved furrow that reveals the tergite as being strongly transverse ; spiracle of tergite I situated on extreme edge of dorsal surface ; hind spurs longer, the inner one reaching beyond middle of the hind basitarsus ; metacarp short but distinct (reduced to a mere stub in an undescribed species of *Paradelius* from S. Africa) ; hind tibia strongly swollen towards apex (as in many Cheloninae).
Flagellum of female thickened medially 6
- 6 Gaster entirely smooth ; no furrow between tergites 1 and (2 + 3). Wings (Text-fig. 2) **ADELIUS** Haliday
- Gaster rugose on at least basal half ; a rugose furrow between tergites 1 and (2 + 3).
PARADELIUS de Saeger

Tribe *MICROGASTERINI*

KEY TO GENERA

- | | | |
|---|---|---|
| 1 | Areolet of the fore wing open distally, the 2nd transverse cubitus wanting | 2 |
| - | Areolet of the fore wing more or less closed distally by the 2nd transverse cubitus | 3 |
| 2 | Tergite 1 and (2 + 3) enlarged and forming together a fused, heavily sclerotised, | |

more or less oval carapace beneath which the more apical segments are completely hidden ; a well developed prepectal margin present ; nervellus of the hind wing deeply sinuate, the submediellan cell being produced distally on the vannal lobe side.

Apical segment of the labial palpus very long, fully twice as long as the short, thick, second segment **FORNICIA** Brullé

- Tergites 1 and (2 + 3) never thus fused to form an oval carapace ; if tergite (2 + 3) is itself enlarged to form a rugose carapace (*carbonarius*-group), then it is clearly separated from tergite 1 ; nervellus not thus sinuate, except weakly in some species of the *lacteus*-group **APANTELES** Foerster (p. 17)
- 3 Hind wing without a closed cubitellan cell, the transverse, cubitellan vein wanting. Ocelli in a high triangle, the transverse, posterior tangent to the anterior ocellus passing far in front of the posterior pair 4
- Hind wing always with a cubitellan cell, closed distally by the spurious, transverse, cubitellan vein ; hardly indicated in the Brazilian genus *Prasmodon* 5
- 4 Areolet of the fore wing very large, the 1st abscissa of the radius being much shorter than the 2nd ; eyes below very wide apart ; tergite 2 polished and with a weakly indicated, sub-triangular field ; metacarp much longer than its distance from the apex of the radial cell. S. Africa **SEMIONIS** gen. n. (p. 206)
- Areolet of the fore wing small, the 1st abscissa of the radius much longer than the 2nd ; eyes strongly convergent below, touching the clypeus, the distance between them here being at most hardly greater than the distance between a posterior ocellus and the eye-margin (Text-fig. 236) ; tergite (2 + 3) with a large, triangular median field. Australia **MIROPOTES** gen. n. (p. 200)
- 5 Nervellus of the hind wing sinuate so that the submediellan cell is produced distally on the vannal lobe side (Text-fig. 345). Vannal lobe beyond its widest part with straight or concave edge and here without trace of a hair fringe ; cubitellan cell of the hind wing always higher than wide. 6
- Nervellus of the hind wing not sinuate and normally curved inwards on the vannal lobe side 8
- 6 Propodeum with costula and more or less distinct areola defined by very strongly raised, irregular keels ; tergite 1 very large, subquadrate, highly polished ; tergite (2 + 3) without a basal, median field, tergite 2 being defined as such and occupying the full width of the gaster (Text-fig. 235) ; scape very short (Text-fig. 253) ; inner spur of the hind tibia considerably less than half the length of the hind basitarsus. Central & S. America **DASYLAGON** Muesebeck (p. 201)
- Propodeum without a costula and without an areola though it sometimes has a very irregularly defined, margined, longitudinal furrow ; tergite 1 neither subquadrate nor highly polished ; scape longer ; inner spur of the hind tibia at least half as long as the hind basitarsus 7
- 7 Tergite 1 short, triangularly widened behind ; median field of tergite (2 + 3) co-extensive with tergite 2 and occupying the full width of the gaster ; coarsely sculptured and fully two thirds as long as the rest of the tergite ; inner spur of the hind tibia about three quarters as long as the hind basitarsus ; head, in a facial view, not lengthened ; mouth parts not lengthened, the glossa not forked. Central & S. America **XANTHOMICROGASTER** Cameron (p. 264)
- Tergite 1 elongate, not widened behind, usually markedly narrowed behind ; median field of tergite (2 + 3) not coextensive with the whole of tergite 2 and not occupying the full width of the gaster, smooth-looking and not more than half as long as the rest of the tergite ; inner spur of the hind tibia about half as long as the hind basitarsus ; head, in a facial view, lengthened or markedly triangular ; mouth parts lengthened, the glossa deeply forked (Text-fig. 254). Central & S. America **PROMICROGASTER** Brues & Richardson (p. 229)

- 8 Scutellum bordered behind by a continuous polished band that medially is not always differentiated from an equally polished scutellar disc ; if, rarely, this band is interrupted at middle, then this is not caused by rugosity 14
- Scutellum without a continuous, polished band behind, the band being interrupted at middle by a rugose area that may or may not be separated from an equally rugose scutellar disc by a short, transverse lip or keel ; if the posterior band is hardly interrupted at middle (some species of *Microplitis*), then a sternaulus is present or there is at least an indication of notaulices 9
- 9 Hind coxa small, not or hardly longer than tergite 1 ; inner spur of the hind tibia never reaching beyond the middle of the hind basitarsus ; 1st abscissa of the discoideus always much shorter than the 2nd, at most about half as long ; metacarp (except in *Alloplitis*) always short, rarely as much as one and a half times longer than its distance from the apex of the radial cell 10
- Hind coxa large, conspicuously longer than tergite 1 ; inner spur of the hind tibia long, always reaching beyond the middle of the hind basitarsus (except in the *reales*-group of *Protomicroplitis* but this group has the metacarp extending almost to the apex of the radial cell) ; 1st abscissa of the discoideus distinctly more than half as long as the 2nd, usually about as long as this (except in *Bulukia*) ; metacarp rarely as short as twice its distance from the apex of the radial cell (*periander*-group of *Protomicroplitis* but this group has the propodeum flattened and polished, a condition never found in the *Microplitis*-group of genera) 13
- 10 Scutellum in the form of a large cone, directed backwards (Text-fig. 234). Philippines
PHILOPLITIS gen. n. (p. 267)
- Scutellum never with such a cone, though it may often show heavy, sometimes bizarre, sculpture 11
- 11 Propodeum of highly exaggerated form, having, in profile, two faces that, at least in the type-species, meet at an angle of distinctly less than 90 degrees ; hind tibia blackish to black ; middle lobe of the mesoscutum separated from the lateral lobes by very deep notaulices (except in *radicalis* but this species has flattened flagellar segments) ; middle lobe of the mesoscutum raised above the level of the lateral lobes, shield-shaped and narrowed behind to the thinness of a keel that divides the deep notaulic troughs ; flagellar segments strongly compressed, flattened and of very exaggerated form, as in the type-species – *vollenhovenii* – or simple, as in *philippinensis* but this last has the exaggerated thoracic structure of the genus.
SNELLENIUS Westwood (p. 270)
- Propodeum lacking this exaggerated form and without an angularly separated dorsal and posterior face ; middle lobe of the mesoscutum not thus raised above the lateral lobes nor in the form a shield with posterior keel ; if the thorax shows something of the exaggerated structure of *Snellenius* and the notaulices are much deepened, then the hind tibia is banded with white or otherwise pale-marked 12
- 12 Tergite (2 + 3) divided into its two component parts, tergite 2 being in the form of a transverse rectangle that is everywhere densely, evenly rugose, shows no trace of a differentiated median field and is at least slightly longer than tergite 3 ; propodeum without dense, coarse reticulation and its spiracle enclosed by strongly raised keels. Philippines **ALLOPLITIS** gen. n. (p. 268)
- Tergite (2 + 3) not thus sharply or not at all divided into its two component parts ; tergite 2 never of this form though sometimes with lateral rugosity ; usually with indication of a raised, or otherwise differentiated, median field ; in any case, never longer than tergite 3 ; frequently there is hardly a trace of a suture marking the separation of tergites 2 and 3.

Propodeum almost always with coarse rugosity ; wings (Text-fig. 342). Old and New World **MICROPLITIS** Förster

- 13 Tergite 3 as heavily sclerotised as 2, conspicuously dome-shaped, longer than 2 ; the two tergites together form a carapace beneath which the more apical segments are completely hidden.
Areolet large, the 2nd transverse cubitus arising from the 2nd abscissa of the radius ; tergite 2 without a median field. Africa . **BULUKA** de Saeger (p. 265)
- Tergite 3 always smooth, polished and never with tergite 2 forming a carapace, except in the *basimacula*-group of *Protomicroplitis* but this group has the areolet very small with the 2nd transverse cubitus arising from the 1st and tergite 2 with an elongate, median field, bordered on each side by a rugose furrow. Old and New World **PROTOMICROPLITIS** Ashmead (part) (p. 234)
- 14 Mesoscutum with very deep, smooth notaulices ; median lobe of the mesoscutum raised, shield-like ; 1st abscissa of the discoideus extremely short, only about one third as long as the 2nd. Peru **PRASMODON** gen. n. (p. 205)
- Mesoscutum without notaulices except that their course may sometimes be indicated by a slight coarsening of sculpture or row of foveae (*Microgaster* spp.) ; median lobe of the mesoscutum never thus raised ; 1st abscissa of the discoideus rarely as short as this 15
- 15 Body more or less completely polished, at most with a little fine punctuation towards front of mesoscutum.
Propodeum highly polished, its sculpture consisting at most of a medial keel ; ovipositor very short, almost hidden 16
- Body not completely polished.
Stigma never orange-yellow (except in the *mediatus*-group of *Protomicroplitis* but this group has the propodeum coarsely rugose) ; vannal lobe with distinct apical notch 17
- 16 Tergite 2 with two divergent furrows that set off a very large, triangular area that occupies the greater part of the tergite ; vannal lobe not notched at apex and hence not defined as such ; very large species, ca. 7 mm. with orange-yellow stigma.
Red-fulvous with dark maculated wings ; 1st abscissa of the discoideus less than half as long as the 2nd. Brazil **LARISSIMUS** gen. n. (p. 204)
- Tergite 2 with two convergent furrows that almost meet behind and then curve outwards to the lateral margin of the segment, dividing it clearly into three areas of which the median is narrowly triangular and widest in front ; vannal lobe notched at apex ; length ca. 4.5 mm. ; stigma evenly dark brown.
Brightly coloured species with head and gaster reddish-yellow and thorax mostly black with yellowish propodeum. N. Guinea
EUTERPE-group of *Protomicroplitis* (p. 250)
- 17 Second abscissa of the mediella of the hind wing about two and a half times longer than the 1st ; 1st abscissa of the discoideus of the fore wing distinctly less than half as long as the 2nd ; claws with a close pectination of 6–8 black spines.
Bright fulvous species ; propodeum polished with medial keel. N. Guinea
PARENION gen. n. (p. 208)
- Second abscissa of the mediella of the hind wing always much shorter in proportion to the 1st, about one and a half times longer ; 1st abscissa of the discoideus of the fore wing about as long as the 2nd or even longer (only exceptionally shorter and then the propodeum is not both polished and with medial keel) ; claws without a pectination of fine spines, though spines, sometimes stout enough to be described as teeth, less evenly spaced, are sometimes present in species of *Microgaster* but all these have a strongly rugose propodeum 18
- 18 Tergite 1 always distinctly widened towards apex, usually distinctly shorter than its apical width, rarely slightly longer ; tergite 2 not distinctly shorter than 3 and, with the exception of *Microgaster politus*, strongly rugose all over and without trace of a median field.

Second transverse cubitus always received onto the 2nd abscissa of the radius at its extreme base or interstitial with the 1st abscissa of the radius (Text-fig. 339) ; propodeum rugose, usually strongly so and with more or less distinct medial keel but never with areola ; vannal lobe beyond its widest part feebly convex and fringed with hairs throughout. Old and New World

MICROGASTER Latreille (p. 267)

- If tergite 1 is at all widened towards apex, then tergite 2 is much shorter than 3 and is virtually smooth and polished all over and the 2nd transverse cubitus is received on to the 1st transverse cubitus so that the areolet is very small 19
- 19 Median field of tergite (2 + 3) always strongly transverse, neither triangular nor subtriangular and appearing very short in comparison with the rest of the tergite beyond it.

Ovipositor always projecting freely beyond the apex of the gaster, its sheaths at least half as long as the hind tibia 20

- Median field of tergite (2 + 3) never transverse, having a pronounced triangular or subtriangular form or elongate-oval 21
- 20 Inner spur of the middle tibia much shorter than the middle basitarsus ; areolet extremely small **PROMICROGASTER** Brues & Richardson (p. 229)

- If the inner spur of the middle tibia is obviously shorter than the middle basitarsus, then the areolet is much larger or the propodeum has a median longitudinal keel

HYPOMICROGASTER Ashmead (p. 208)

- 21 Mouth parts lengthened, the glossa deeply forked and the galea much longer than wide ; propodeum polished and without keel or areola ; hypopygium very long, membranous, tightly folded along the middle line in death ; ovipositor very long, its sheaths fully one and a half times longer than the hind tibia ; median field of tergite (2 + 3) much longer than wide **SENDAPHNE** gen. n. (p. 203)

- Mouth parts not at all lengthened, the glossa and the galea normal ; propodeum rugose, with or without a medial keel (polished and without a keel in the *tegularis*-group) ; hypopygium short (but only male of *tegularis*-group known), more or less evenly sclerotised throughout and not tightly folded along the middle line in death ; ovipositor very short, almost hidden ; median field of tergite (2 + 3) at most slightly longer than wide **PROTOMICROPLITIS** Ashmead (p. 234)

APANTELES Förster

KEY TO SPECIES-GROUPS

FEMALES

- 1 Plate of tergite 1 four to five times as long as its apical width, more or less constricted medially and deeply grooved almost to apex 2
- Plate of tergite 1 not of this shape or, if it is long and tends to be constricted medially, then it is without a percurrent groove (*pistrinariae*-group and, exceptionally, in *ater*-group) 3
- 2 Brachial vein, where it is closest to the wing-edge, separated from the wing-edge by less than its own width (Text-fig. 114) ; disc of scutellum separated from the posterior, polished band by a lip or ridge ; hind coxa above and towards apex with one or two longitudinal ridges and towards apex with many strongly raised wrinkles that form an irregular reticulation **henicopus**-group (p. 197)
- Brachial vein at its closest to the wing-edge separated from the wing-edge by fully its own width ; disc of scutellum flattened, polished and not separated from the posterior, polished band of the scutellum ; hind coxa above without longitudinal ridges though transversely ribbed towards apex.

Very large, fulvous species, ca. 5.5 mm. with deeply notched claws and wide, transverse face. New Britain **daira**-group (p. 198)

- 3 Notaulices deeply impressed as intricately rugose furrows.
Ocelli in a high, virtually equilateral triangle. W. Indies **aciculatus-group** (p. 181)
- Notaulices never impressed, though their course is very frequently indicated by a band of duller, denser, sometimes rugose, sculpture 4
- 4 Propodeum with an areola and almost always with costulae that define on each side a postero-lateral area ; if the costulae are absent and the areola is weakly defined, then the propodeum tends to be dull and sculptured all over and/or the vannal lobe beyond its widest part is concave and without trace of a hair-fringe here 5
- Propodeum rarely with trace of an areola and never with costulae ; if there is a faint indication of an areola, then the edge of the vannal lobe beyond its widest part is not concave, though it may be virtually straight here and shows the merest trace of a fringe or the fore wings are dappled 12
- 5 Edge of vannal lobe beyond its widest part usually deeply concave, the concave edge being completely free from projecting hairs ; if, rarely, this edge is virtually straight and shows an indication of a hair-fringe, then either the median field of tergite 1 is more or less coextensive with the whole surface of tergite 2 and almost as long as tergite 3 or, tergite 1 is very long, strongly narrowed posteriorly and wedge-shaped or, the costulae of the propodeum are situated anterior to middle so that the postero-lateral areas do not appear as transverse 8
- Vannal lobe beyond its widest part evenly convex and with a distinct hair-fringe throughout.
Tergite 1 never wedge-shaped ; postero-lateral areas of the propodeum always distinctly transverse ; mesoscutum with a prevailing sculpture of sharp punctation at the posterior end of the imaginary course of the notaulices 6
- 6 Tergites 2 and 3 subequal in length.
Tergite 1 broadly triangular, not longer than apically wide 7
- Tergites 2 and 3 not equal, 2 being shorter than 3 or, if not, then tergite 1 is distinctly longer than apically wide.
Ovipositor sheath always projecting freely beyond the apex of the gaster. Old and New World **ultor-group** (p. 126)
- 7 Tergite 3, as well as 2, densely rugose all over ; hind spurs short, subequal, the inner one not reaching middle of hind basitarsus. N. America **bucculatricis-group** (p. 148)
- Tergite 3 polished ; tergite 2 coarsely rugose-striate ; hind spurs not subequal, the inner one much longer than the outer one and reaching the middle of the hind basitarsus.
Ovipositor sheath hardly exerted ; 1st abscissa of the discoideus much shorter than the 2nd. Costa Rica **paradoxus-group** (p. 127)
- 8 Hypopygium short, evenly sclerotised throughout, not folded along the middle line and without trace of lateral, longitudinal creasing ; cheeks with a whitish, semi-transparent patch ; tergite 1 on its posterior, horizontal surface with a narrow, deep furrow that has strongly raised margins ; these margins unite or almost unite anteriorly to form a short, conspicuous keel. N. and S. America **nigriceps-group** (p. 126)
- Hypopygium, even if short and not readily visible in the dead insect, then at least folded along a more weakly sclerotised middle line and nearly always with distinctly lateral creasing ; if tergite 1 shows a longitudinal furrow (frequent in *ater-group*) then this is broader, less sharply defined and lacks raised, lateral margins ; cheeks without a whitish patch 9
- 9 Tergite 2 without a delimited median field, the whole tergite densely rugose-striate, and fully as long as tergite 3.
Hind coxa and ventral surface of gaster reddish yellow and together with the almost entirely yellow hind femur in sharp contrast with the blackish hind tibia ;

posterior transverse tangent to the anterior ocellus passing far in front of the posterior pair. Indo-oriental region ***schoenobii*-group** (p. 128)

- Tergite 2 with a delimited median field ; if the field is large and ill defined then this is largely through being as smooth and polished as tergite 3 ; in any case, the median field is never coextensive with the whole surface of tergite 2 and is obviously shorter than tergite 3 10

- 10 Tergite 1 narrowly wedge-shaped, its horizontal surface at least twice as long as wide across the hump (Text-fig. 183).

Vertex between the eye and the posterior ocellus never with punctures but the surface here and sometimes that of the mesoscutum often with a satin-like sheen (absent in *ater*-group except in some species with incomplete propodeal areolation) ; propodeum with complete, sharply defined areolation ; ovipositor sheath fully as long as the hind tibia. Indo-oriental region ***taeniaticornis*-group** (p. 120)

- Tergite 1 not obviously wedge-shaped though frequently markedly narrowed posteriorly ; horizontal part rarely more than one and a half times as long as wide across the hump and then the hind wing is broader than in the *taeniaticornis*-group 11

- 11 Face rostriform, the clypeo-facial suture lying far below a line joining the eyes below.

Mesoscutum densely, coarsely, confluent punctate, especially broadly along the course of the notaulices, at posterior end of which the surface becomes striate-punctate ; tergite 1 broad, not at all narrowed posteriorly and with a large, shallow median trough. N. America ***crassicornis*-group** (p. 127)

- Face not rostriform, the clypeo-facial suture lying above or virtually on this line.

A few S. African species have the face somewhat rostriform and the mouth parts lengthened but these have the areolation of the propodeum reduced to an ill defined V-shaped areola ; such species, and others having a normal face but likewise with reduced propodeal areolation, are nearly always recognisable by the concavity of the vannal lobe and the shortness of the cubitellan cell of the hind wing. Old and New World. ***ater*-group** (p. 25)

- 12 Tergite (2 + 3) forming a much enlarged, densely to coarsely rugose segment that completely (Philippines) or nearly completely (Europe) hides the more apical segments ; this segment is clearly notched at the lateral extremity of the well marked second suture ; propodeum polished, with medial keel.

Spp. not exceeding 1.8 mm. with concealed ovipositor and the cubitellan cell of the hind wing about three times as long as wide. Old World

***carbonarius*-group** (p. 147)

- Tergite (2 + 3) never as large as this and if 3 shows an amount of rugosity approaching that of 2, then the propodeum is quite differently sculptured 13

- 13 Tergite 1 narrow and with a distinct medial constriction (Text-fig. 113).

Propodeum with a flattened, steep, posterior face, rugose all over and separated from the short, linear, almost smooth upper face by a distinct cristula ; tergite 2 with a triangular, median field having base only slightly longer than sides. Africa

***pistrinariae*-group** (p. 138)

- Tergite 1 without a medial constriction and if long and narrow, then the tergite is gradually narrowed from base to apex and the propodeum never shows a trace of a cristula dividing it into an anterior and posterior face 14

- 14 Fore wing with a dark cloud beneath the stigma.

Propodeum either without or with a faintly indicated areola but without a trace of costulae ; its surface in greater part almost smooth ; ovipositor sheath at least as long as the hind tibia. Fiji Is., Hawaii ***trifasciatus*-group** (p. 124)

- Fore wing without a dark cloud beneath the stigma though the wing is frequently brownish all over 15

- 15 Vannal lobe beyond its widest part markedly concave and here without a hair-fringe (Text-fig. 131).

Tergite 1 strongly, abruptly narrowed behind, its apical width rarely as much as two thirds its greatest width, usually about half this ; head in a facial view more or less circular, except in *lacteoides* which has it distinctly triangular but this species has a strong medial keel on the propodeum and a short scape ; inner spur of the hind tibia at least half as long as the hind basitarsus. Old and New World

merula-group (p. 150)

- Rarely the vannal lobe with a distinctly concave, fringeless edge and then either the head in a facial view is strongly rostriform with long scape and tergite 1 is hardly narrowed behind (*lacteus*-group) or the inner spur of the hind tibia does not quite reach the middle of the hind basitarsus (*grandiculus*-group) or there is a faint trace of an areola 16
- 16 Mouth parts modified and lengthened, the galea fully twice as long as wide and/or the head either obviously rostriform or at any rate markedly triangular in facial view. Ovipositor widely exerted ; hypopygium membranous and with numerous lateral creases ; median field of tergite 2 very short and with acute, lateral angle 17
- Mouth parts simple, the head, in a facial view, never rostriform though it may sometimes be subtriangular 20
- 17 Metacarp shorter than the stigma and shorter than its distance from the apex of the radial cell.

Intensely black species with the wings deeply embrowned and the legs dull black throughout ; propodeum rugose with weak medial keel ; vannal lobe beyond its widest part with hardly a trace of a hair-fringe ; hind spurs blackish, the inner one about three quarters as long as the hind basitarsus. Central Europe

vipio-group (p. 128)

- Metacarp much longer ; wings only in the S. African *caesar*-group as dark as this and then the hind tibia is predominantly reddish 18
- 18 Wings deeply embrowned ; metacarp hardly twice as long as its distance from the apex of the radial cell ; tergite 1 strongly narrowed behind ; inner spur of the hind tibia just reaching beyond the middle of the hind basitarsus. S. Africa

caesar-group (p. 129)

- Wings hyaline or milky-white ; metacarp at least three times as long as its distance from the apex of the radial cell ; tergite 1 not narrowed behind ; inner spur of the hind tibia not, or hardly, longer than the outer one and not reaching middle of the hind basitarsus 19
- 19 Face distinctly rostriform (Text-fig. 120) ; labial and maxillary palpus of ordinary form ; vannal lobe beyond its widest part markedly concave and here without trace of a hair-fringe.

Venation mostly colourless ; stigma yellowish with faintly darker border and metacarp still darker ; propodeum without a medial keel. Europe

lacteus-group (p. 129)

- Face triangular ; palpi highly modified, black, both pairs being clothed with adpressed hairs on posterior side but otherwise bare ; apical segment of both labial and maxillary palpus sharply tapered apically ; vannal lobe very slightly straightened out beyond its widest part but with distinct hair-fringe throughout. Inner spur of the hind tibia slightly shorter than the outer one. Europe

longipalpis-group (p. 181)

- 20 Vannal lobe very obviously concave beyond its widest part and hence becoming acuminate distally ; its concave edge completely without hair-fringe.

Nervellus strongly incurved and much longer than the submediella (Text-fig. 180) ; ovipositor sheath about twice as long as the hind tibia. Africa. Oriental Region

grandiculus-group (p. 166)

- Vannal lobe at most with straight edge beyond its widest part and then the edge has distinctly projecting hairs or the nervellus is not strongly incurved and is not

- longer than the submediella (except in some species of the *metacarpalis*-group but these do not have the ovipositor sheath longer than the hind tibia) ; or the ovipositor is very short (*formosus*-group) 21
- 21 Propodeum divided by keels into two large dorsal areas that are almost as long as wide and a short, posterior, almost vertical surface that is strongly transverse and is not divided medially by the anterior keel (Text-fig. 142).
 Antenna of female with white medial band. S. Africa . . . **camma-group** (p. 131)
- Propodeum rarely thus divided by keels (*insolens*-group) and then the dorsal areas are strongly transverse 22
- 22 Propodeum with transverse keel as well as a complete, longitudinal keel ; the transverse keel situated far anterior to middle and cutting off on each side of the propodeum a strongly transverse area.
 Mesoscutum bright reddish-yellow ; face strongly, almost coarsely punctate ; cubitellian cell of the hind wing twice as long as wide ; ovipositor sheath about three quarters as long as the hind basitarsus. S. Africa . . . **insolens-group** (p. 132)
- Propodeum without the combination of a transverse and a longitudinal keel 23
- 23 Hypopygium as evenly sclerotised along the middle line as elsewhere and never with creases along each side of the middle line ; ovipositor sheath almost always short, not projecting beyond the apex of the hypopygium by a length greater than that of the 2nd segment of the hind tarsus and then it appears dagger-shaped and hairy only at tip (but cf. *hyphantriæ* of *glomeratus*-group) ; if the sheath projects freely and is long (*falcatus*-group) then the median field of tergite 2 is triangular or sub-triangular and either the anterior margin of the postscutellum does not show, laterally, a small, forwards pointing projection (Text-fig. 129), or the claws are finely pectinate (*validus*-group) 24
- Hypopygium more weakly sclerotised along the middle line than elsewhere so that in the dead insect it is often infolded and tightly creased here ; on each side of the middle line it frequently shows longitudinal creases ; ovipositor sheath projecting beyond the apex of the hypopygium by a length clearly greater than that of the 2nd segment of the hind tarsus ; even if the sheath is short and approaches the length of the 2nd segment of the hind tarsus, then it is hairy throughout and never dagger-shaped ; cf. certain species of *circumscriptus*-group in which a rather short ovipositor is combined with a hypopygium that is hardly or not at all more weakly sclerotised along the middle line but the anterior margin of the postscutellum shows laterally a small, forwards pointing projection (Text-fig. 127) 36
- 24 Tergite 2 with an isolated, sharply delimited median field that is parallel-sided or widened anteriorly where it is usually narrower than the apical width of tergite 1 ; further, this median field is margined on each side by a deep, smooth to rugose furrow. Africa **mlanje-group** (p. 133)
- Tergite 2 either without a delimited median field or, if one is present, then it is always wider behind than in front.
 In *eucosmae* (Africa), belonging to the *octonarius*-group, this field is virtually elongate-rectangular but the ovipositor sheath projects, dagger-like, beyond the strongly developed hypopygium by a distance equal to the length of the 2nd segment of the hind tarsus 25
- 25 Side of pronotum without trace of a dorsal furrow or, if doubtfully indicated, then the propodeum with strong medial keel 26
- Side of pronotum with a distinct dorsal furrow (Text-fig. 125) or, if doubtfully present as in the aberrant New Zealand *demeter*, then the propodeum strongly, evenly rugose and the flagellum very short and thick 28
- 26 Propodeum dull, rugose all over and with a strong, medial keel.
 Tergite 1 elongate and at least a little narrowed behind, dull, rugose all over ; flagellum very long, thin, with the preapical segment fully twice as long as wide ;

phragma of the scutellum widely visible. Europe. N. America.

***pallipes*-group** (p. 187)

- Propodeum on the whole smooth, usually highly polished and always without a medial keel.

Vannal lobe beyond its widest part with a straight or slightly concave edge and here often without a distinct fringe ; tergite (2 + 3) either without a median field or, if one is present, then this is obviously triangular 27

- 27 Antenna of female extremely short, shorter than the body with the preapical segment at most one and a half times longer than wide.

Highly polished spp. with short, thick legs that are predominantly reddish yellow with the hind femur always of this colour ; inner spur of the hind tibia always distinctly longer than half the hind basitarsus. Africa to Indo-australian region

***congoensis*-group** (p. 188)

- Antenna of female normal, longer than the body, except in *papilionis* and *geometrivorus* ; all flagellar segments very obviously elongate ; preapical segment rarely as short as about one and a half times longer than wide.

Propodeum rather short, its spiracle being separated from the posterior corner by not more than three to four times its own diameter (Text-fig. 225) ; 1st abscissa of the discoideus always very distinctly shorter than the 2nd. Old and New World but mostly Africa ***formosus*-group** (p. 191)

- 28 Propodeum strongly to coarsely rugose ; usually showing also a large, posterior, flattened surface, bounded above, on each side, by a short, transverse cristula ; in front of each cristula is a short, transverse area that tends to be smoother than the surface elsewhere ; tergite 1 usually widened behind, never narrowed, though its apical corners are often gently, roundly constricted.

Tergite 2 with or without sulci delimiting a median field but, in any case, this tergite is at least two thirds as long as 3 ; normally, the median field of tergite 2 is strongly transverse, subrectangular and rugose ; if, rarely, it approaches a subtriangular shape and is virtually smooth, then the sides of the triangle are much shorter than the base. World-wide in distribution . . . ***glomeratus*-group** (p. 133)

- If the propodeum is coarsely rugose, then tergite 1 is narrowed behind and obviously wedge-shaped or the apical segment of the front tarsus is armed with a conspicuous, lateral spine (Text-fig. 143) 29

- 29 Inner side of the apical margin of the hind tibia with a dense, silky fringe that is entirely differentiated from the normal tibial hairs.

Propodeum short, with a well defined medial keel ; propodeal spiracle enclosed by a keel at least on its posterior side ; phragma of the scutellum hidden ; ovipositor very short, almost hidden 30

- Inner side of the apical margin of the hind tibia without such a differentiated fringe though it is almost differentiated in some species of the *vitripennis*-group but in these species the propodeal keel is never enclosed, even partly, by a keel . . . 31

- 30 Tergite 1 strongly, almost concavely narrowed from a wide base to a very narrow apex ; the keel that lies posterior to the propodeal spiracle is continued forwards diagonally across the propodeum as far as the anterior extremity of the medial keel ; 1st abscissa of the radius and the transverse cubitus forming a well defined angle at their junction ; posterior ocellus separated from the eye-margin by about twice its own diameter ; vannal lobe with distinct hair-fringe throughout. Java, Philippines ***siderion*-group** (p. 138)

- Tergite 1 virtually parallel-sided to where it turns over and thence narrowed to apex ; the keel that lies behind the propodeal spiracle does not extend as far as the anterior extremity of the medial keel ; no angle at the junction of the 1st abscissa of the radius and the transverse cubitus (Text-fig. 149) ; vannal lobe beyond its

widest part straight and here with distinct hair-fringe. Borneo. Philippines

merope-group (p. 139)

- 31 Claws finely pectinate (Text-fig. 230).

Pubescence of flagellum unusually long (Text-fig. 232); propodeum almost smooth; postscutellum laterally with a small forwards pointing projection on its anterior margin (Text-fig. 127); ovipositor sheath two thirds as long as the hind tibia; tergites 1 and (2 + 3) (Text-fig. 231). Europe. **validus-group** (p. 199)

- Claws not pectinate or if so (a rare exception in the *octonarius*-group) then the ovipositor sheath very short 32

- 32 Median field of tergite 2 transverse, weakly rectangular (Text-fig. 233), with the 2nd suture either markedly sinuate or if less so, then the ovipositor sheath yellow.

Ovipositor sheath widely exerted. Europe. N. America **falcatus-group** (p. 184)

- Median field of tergite 2 usually markedly triangular; if somewhat rectangular, then the ovipositor very short.

Ovipositor almost always very short, though often projecting as a short, sharply pointed dagger; only in a few species of the *vitripennis*-group does it project freely beyond the apex of the gaster but in these species the hypopygium has no lateral longitudinal creases and other characters of the group apply 33

- 33 1st abscissa of the radius and the transverse cubitus distinctly angled at their junction 34

- 1st abscissa of the radius and the transverse cubitus forming a weak, even curve at their junction (Text-fig. 157).

Propodeum, tergite 1 and the median field of tergite 2 tending to be smooth, highly polished; edge of vannal lobe beyond its widest part more or less straight and virtually without a hair-fringe; median field of tergite 2 never bordered with fine aciculation or striation as often occurs in the closely related *vitripennis*-group. World-wide in distribution

octonarius-group (p. 186)

- 34 Tergite 1 usually broad, more or less parallel-sided to where it turns over and thence distinctly, roundly narrowed to apex; median field of tergite 2 transverse and varying from subrectangular to subtriangular, its lateral sulcus directed towards the lateral margin, or posterior corner, of the tergite.

Apical segment of the front tarsus always with a distinct spine and opposite to it an emargination of the tarsal segment (Text-fig. 144). Europe. N. America

popularis-group (p. 135)

- Tergite 1 on the whole long, gradually narrowed from base to apex; median field of tergite 2 clearly and usually conspicuously triangular and its lateral sulcus directed towards the 2nd suture.

Edge of vannal lobe with well developed fringe of hairs throughout. 35

- 35 Antenna very short, thick, only the first and last segment of the flagellum being obviously longer than wide; phragma of the scutellum completely concealed.

Very small sp., ca. 1.6 mm. with coarsely rugose propodeum. New Zealand

demeter-group (p. 196)

- Antenna never short and thick, all the segments of the flagellum being obviously longer than wide; phragma of the scutellum always clearly visible. World-wide

vitripennis-group (p. 187)

- 36 Tergite (2 + 3) without a delimited median field, tergite 2 being evenly rectangular, about two and a half times as wide as medially long, more or less equal in size to tergite 3 and strongly rugose all over; tergite 3 with longitudinal rugosity covering most of its surface.

Coarse sculpture of the scutellar disc extending right to posterior tip and interrupting the posterior, polished band of the scutellum; metacarp about one and a quarter times longer than its distance from the apex of the radial cell. N. America

terminalis-group (p. 131)

- Tergite (2 + 3) always with some sort of delimited median field which, if it tends to be coextensive with the whole of tergite 2, is normally much shorter than 3, except in a few species of the *circumscriptus*-group with strongly sculptured 1st and 2nd tergite ; if such a median field is hardly delimited, then this is because the whole of tergite (2 + 3) is smooth and polished ; tergite 3 never with obvious sculpture, its surface having at most a dull sheen 37
- 37 Propodeum with a strong, medial keel 38
- Propodeum without such a keel 41
- 38 Polished, lateral field of the scutellum large enough to cut off between itself and the disc a long, parallel-sided, foveate groove ; ocelli in a low triangle, with the transverse, posterior tangent to the median ocellus cutting deeply into the posterior ocelli.
 Inner spur of the hind tibia very long, fully three fifths as long as the hind basitarsus. Indo-malayan region **sundanus-group** (p. 170)
- Polished, lateral field of the scutellum much smaller, short from back to front and hence cutting off between itself and the disc a rugose tongue that gradually narrows posteriorly ; ocelli in a higher triangle, the posterior, transverse tangent to the median ocellus at most touching the posterior ocelli 39
- 39 Cubitellan cell of hind wing extremely short on radiella and cubitella, hence much higher than long (so much higher than long, and thus narrow, in the *annulicornis*-group, as to be easily overlooked) 40
- Cubitellan cell less short and longer than high. America. Oriental region
 **nerion-group** (p. 142)
- 40 Cubitellan cell at most about one and a half times higher than long on the cubitella ; tergite 1 only slightly narrowed posteriorly, its turned over, posterior part rugose all over.
 Transverse cubitus rather long ; vannal lobe beyond its widest part straight or slightly concave and here with at most an occasional projecting hair ; median field of tergite (2 + 3) rugose, rectangular, strongly transverse ; inner spur of the hind tibia much longer than the outer one and reaching slightly beyond the middle of the hind basitarsus. Brazil. N. America **sesiae-group** (p. 144)
- Cubitellan cell at least twice as high as long (Text-fig. 130) ; tergite 1 very strongly narrowed posteriorly, almost wedge-shaped.
 At least the mesoscutum and mesopleurum yellow ; propodeum, apart from the median keel, highly polished ; inner spur of the hind tibia considerably longer than the outer one and almost reaching the middle of the hind basitarsus ; anterior declivous part of tergite 1 deeply channelled. W. Indies. Brit. Guiana
 **annulicornis-group** (p. 140)
- 41 Tergite 1 usually markedly narrowed to apex, long, more or less wedge-shaped.
 Vannal lobe beyond its widest part more or less straight and virtually without projecting hairs ; ovipositor sheath always longer than the hind tibia. Where tergite 1 is almost parallel-sided as in *inunctus*, only the shape of the vannal lobe separates the group from the *laevigatus*-group. Indo-oriental region
 **mycetophilus-group** (p. 171)
- If tergite 1 is strongly narrowed to apex (as in nearly all species of the *metacarpalis*- and *circumscriptus*-groups), then the vannal lobe has a more or less evenly convex edge which is fringed throughout ; or else the metacarp is unusually short 42
- 42 Tergite 1 strongly constricted at apex, never so long, nor so clearly wedge-shaped, as in the *mycetophilus*-group.
 Hypopygium short and rarely with longitudinal creases on each side of middle line (but cf. *murinanae*) ; median field of tergite (2 + 3) triangular, shorter than the hind tibia (but cf. *murinanae* and *dioryctriae*) ; stigma often pale but never with contrasting, pale basal spot 43

- Tergite 1 rarely narrowed towards apex and then never so strongly as above and then the ovipositor sheath is very long 44
- 43 Hind femur entirely yellow and the stigma pallid or, if femur and stigma dark, then the metacarp is fully three times as long as its distance from the apex of the radial cell ; outer side of the hind tibia with only very sparse, hardly differentiated spines and these all of one kind.
Mesoscutum with dull, satin-like sheen ; ovipositor sheath at most about two thirds as long as the hind tibia. Holarctic *circumscriptus*-group (p. 145)
- Hind femur blackish or, if flushed with paler colouring along sides, then the metacarp is hardly twice as long as its distance from the apex of the radial cell ; outer side of the hind tibia with numerous spines of two kinds.
Not readily easily separable from the *circumscriptus*-group but apparently not parasites of leaf-mining Lepidoptera as is the *circumscriptus*-group. Holarctic
metacarpalis-group (p. 148)
- 44 Eyes strongly convergent below, the distance between them across the clypeus not more than two thirds the greatest distance between them on the frons.
Metacarp very short, hardly longer than its distance from the apex of the radial cell. Europe *butalidis*-group (part) (p. 182)
- Eyes rarely convergent below and then not as close as above 45
- 45 Metacarp very short, at most about one and one third times as long as its distance from the apex of the radial cell.
Propodeum coarsely, evenly rugose ; wings markedly brownish. Europe
butalidis-group (part) (p. 182)
- Metacarp rarely as short as this and then the propodeum tends to be smooth and polished ; median field of tergite 2 strongly transverse, never triangular ; stigma frequently with pale, basal spot ; ovipositor sheath usually longer than the hind tibia. World-wide in distribution but commonest in temperate regions
laevigatus-group (p. 181)

THE *ATER*-GROUP

Group S of Wilkinson, in part.

Wilkinson's group S was very broadly based and contained many species that I now consider as belonging to the *ultor*-group.

The *ultor*-group is much more natural than the *ater*-group, from which it differs on a combination of three characters. These are :— (1) mesoscutum always with a distinct, sharp, discrete punctation and without a trace of striation or striate-punctation at the posterior end of the imaginary course of the notaulices ; (2) postero-lateral area of the propodeum distinctly transverse, whereas in the *ater*-group, if such an area is delimited at all, it is as long as, or slightly longer than, wide ; (3) vannal lobe, in sharp contrast with almost the whole of the *ater*-group, with an evenly convex edge that is fringed throughout with very short hairs.

The *ater*-group, on the other hand, lacks the homogeneity of the *ultor*-group, containing many aggregates of species that are not closely related but merge into one another through transitional forms. I have found it convenient to split off from the major group only a single, small assemblage of closely related species that I designate as the *eublemmae*-subgroup ; except *upis*, these species are all African.

The *ater*-group is well represented on the American continent.

KEY TO SUBDIVISIONS OF THE *ater*-GROUP S.L. OF THE OLD WORLD

- A Propodeum with a distinct areola and a costula that, in its extension towards the lateral margin of the propodeum, forks to enclose the spiracle ; frequently only the posterior fork is present ; if the costula and its forks are virtually absent, then the surface of the propodeum still shows much coarse rugosity.
Metacarp of the fore wing much longer than its distance from the apex of the radial cell, except in *argiope* and *ippeus* **ater-group** (in part) (p. 26)
- B Propodeum with at most a feebly defined areola and never with a costula ; hence, the spiracle neither wholly nor in part enclosed by keels ; propodeum to sides of areola with a dull microsculpture or even nearly smooth, or, if rather strongly rugose (*trabea*), then the metacarp hardly one and half times longer than its distance from the apex of the radial cell.
Small, dark-legged spp. with the hind tibia deeply infuscate to blackish ; *linus* is exceptional in respect of leg colour ; gaster beyond tergite 2, that is, beyond the mid-basal field of tergite (2 + 3), always with a dull sheen
eublemmae-subgroup (p. 104)

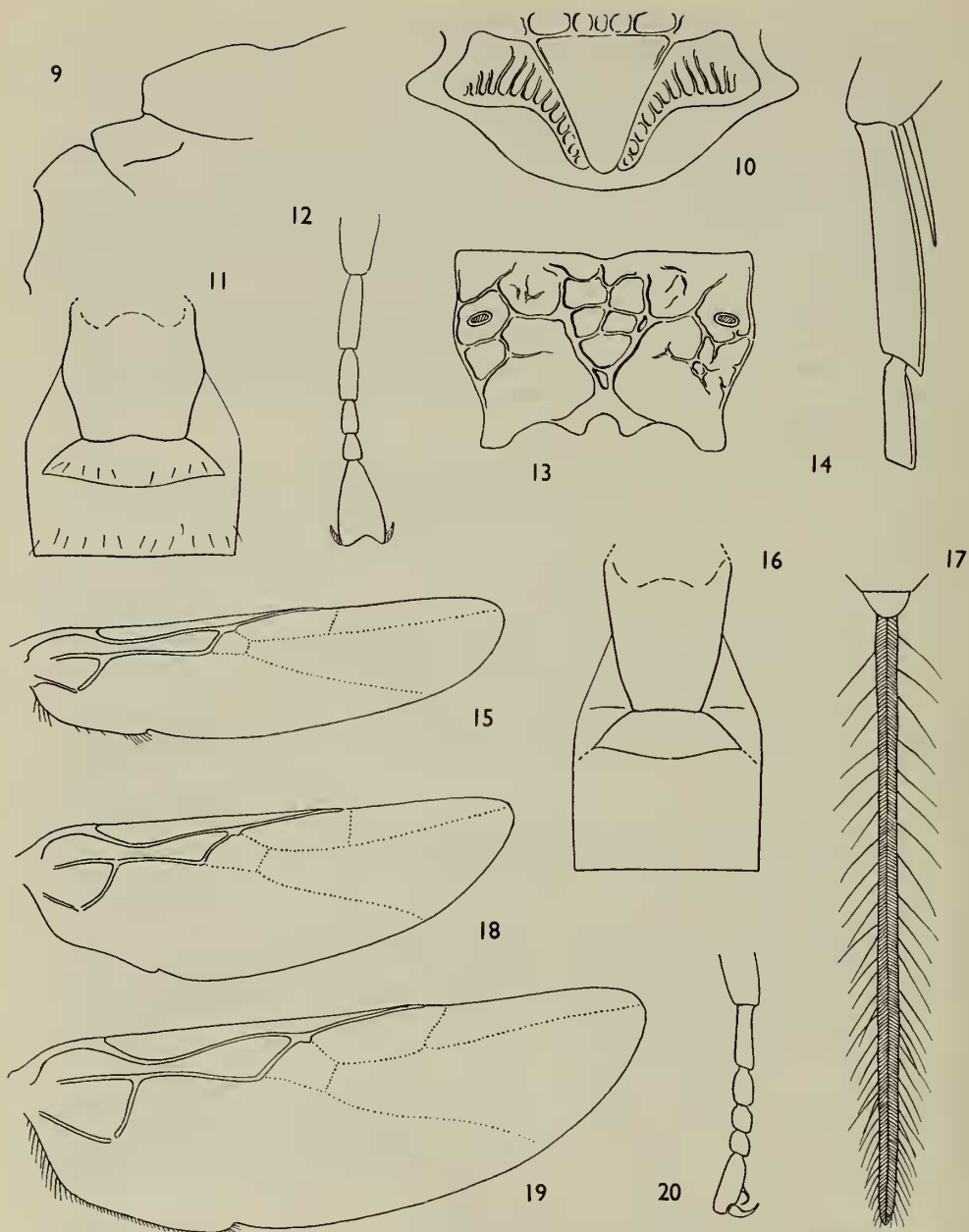
The *ATER*-group (in part)KEY TO SPECIES
FEMALES

- 1 Whole body yellow-fulvous.
Aberrant species not falling easily into either the *ater*- or the *ultor*-group.
Flagellum long, thick, tapered distally, bristly and with the preapical segment one and a half times longer than wide ; mesoscutum highly polished and only indistinctly punctate ; propodeum with complete areolation but the postero-lateral area distinctly transverse ; wings brownish ; metacarp extremely long ; vannal lobe with its edge beyond widest part more or less straight and fringed throughout ; ovipositor sheath as long as the hind tibia. Philippines **bakeri** Wilkinson¹
- At most the gaster pale-marked 2
- 2 Disc of scutellum strongly narrowed behind and in profile with a short, truncate or subtruncate posterior face (Text-fig. 9) ; usually with at least a trace of vaguely defined pits or punctures and often with much rugosity ; propodeum usually with complete areolation ; metacarp at least four times as long as its distance from the apex of the radial cell ; tergite 1 elongate but not evenly wedge-shaped, the distance between its median hump and apex at least as long as wide (except in *cypris*) ; median field of tergite (2 + 3) at least twice as wide as long 3
- If the disc of the scutellum answers to above description, then either the propodeum shows incomplete areolation (no costula present) or the stigma is pallid (pellucid) or the median field of tergite (2 + 3) is much less transverse or tergite 1 is obviously wedge-shaped, that is, evenly narrowed from base to apex 34
- 3 Antennal scrobes greatly deepened, the excavation extending outwards and touching the eye-margin. Philippines **cavifrons** sp. n. (p. 44)
- Antennal scrobes of ordinary form, the excavation never reaching as far as the eye-margin 4
- 4 Ovipositor sheath very short, about one third as long as the hind tibia ; apical segment of front and middle tarsus much enlarged (Text-fig. 12).
Tergite (2 + 3) yellow with the median field darker. Philippines **crius** sp. n. (p. 46)
- Ovipositor sheath at least two thirds as long as the hind tibia (about half as long in the African *arsanes* but this species has tergite (2 + 3) entirely dark) ; apical segment of front and middle tarsus not enlarged 5

¹*Apanteles bakeri* Wilkinson, 1932a 1 : 143.

Type in U.S. National Museum ; paratypes in British Museum (Nat. Hist.).

- 5 Eyes markedly convergent below (Text-fig. 27).
 Ovipositor sheath at most one and a quarter times longer than the hind tibia 6
 - Eyes not noticeably convergent below 23
 6 Hind coxa at least in apical half extensively yellow 7
 - Hind coxa virtually blackish throughout 13
 7 Median field of tergite (2 + 3) very acutely angled laterally at about 30 degrees and itself between four and five times as wide as long (Text-fig. 26).
 Hind coxa in greater part pale yellow with a tongue of infuscation extending forwards on outside and sometimes almost uniting with a paler, apical spot ; metacarp extremely long and almost closing the radial cell (Text-fig. 22).
 Philippines *lyridice* sp. n. (p. 46)
 - Median field of tergite (2 + 3) much less acutely angled laterally, its corners angled at between 45 and 60 degrees ; the field itself much less transverse 8
 8 Hind coxa entirely yellow, faintly shining and without obvious rugosity 9
 - Hind coxa with at least a small basal area of infuscation and the outer face with some sort of rugosity 11
 9 Median field of tergite (2 + 3) nearly three times as wide as long, 11 : 4 ; ovipositor sheath nearer to three quarters as long as the hind tibia. Africa *acoris* sp. n. (p. 52)
 - Median field of tergite (2 + 3) less transverse, at most hardly more than twice as wide as long ; ovipositor sheath nearer to two thirds as long as the hind tibia 10
 10 Tergite 1 distinctly widened posteriorly ; median field of tergite (2 + 3) less than twice as wide as long, 11 : 6 ; dull, rugulose ; dark and pale halves of the hind tibia less sharply contrasted. Africa *meriones* sp. n. (p. 52)
 - Tergite 1 not widened posteriorly ; median field of tergite (2 + 3) slightly more than twice as wide as long, shiny, almost polished ; dark and pale halves of the hind tibia more sharply contrasted.
 Ovipositor sheath a little shorter than in *meriones*. Africa *agatillus* sp. n. (p. 51)
 11 Hind coxa infusate only at extreme base ; outer side of hind coxa without rugosity except at extreme base.
 Hairy part of the ovipositor sheath hardly more than half as long as the hind tibia ; ovipositor thick, strongly curved (Text-fig. 109) ; hind femur infusate on apical three fifths ; scape dark ; flagellum thin. Africa *agrus* sp. n. (p. 51)
 - Hind coxa much more darkened (but cf. *metellus*) ; side of hind coxa considerably rugose.
 Hind femur bright yellow on at least nearly basal half 12
 12 Hind leg strikingly black and yellow ; hind coxa yellow on almost apical half ; hind femur sharply brown on rather more than apical half ; median field of tergite (2 + 3) less transverse, its lateral sulcus almost as long as its basal width ; head thicker, with temples somewhat produced backwards ; tergite (2 + 3) beyond the median field, yellow. Africa *menes* sp. n. (p. 51)
 - Hind leg less strikingly bicoloured ; hind coxa usually almost black but sometimes infusate only at extreme base ; hind femur infusate only at apex and then more especially above ; median field of tergite (2 + 3) more transverse, a lateral sulcus equal to hardly more than two thirds the basal width ; head less thick ; tergite (2 + 3) beyond the median field entirely dark.
 Ovipositor sheath slightly longer than in *menes*. Africa *metellus* sp. n. (p. 50)
 13 Ovipositor sheath at most as long as the hind tibia 14
 - Ovipositor sheath at least slightly longer than the hind tibia 22
 14 Punctures at posterior end of the imaginary course of the notaulices very large, more or less discrete and without longitudinal elements here ; the surface between the punctures very shiny ; hind tibia dark brown but sharply whitish on basal two fifths.

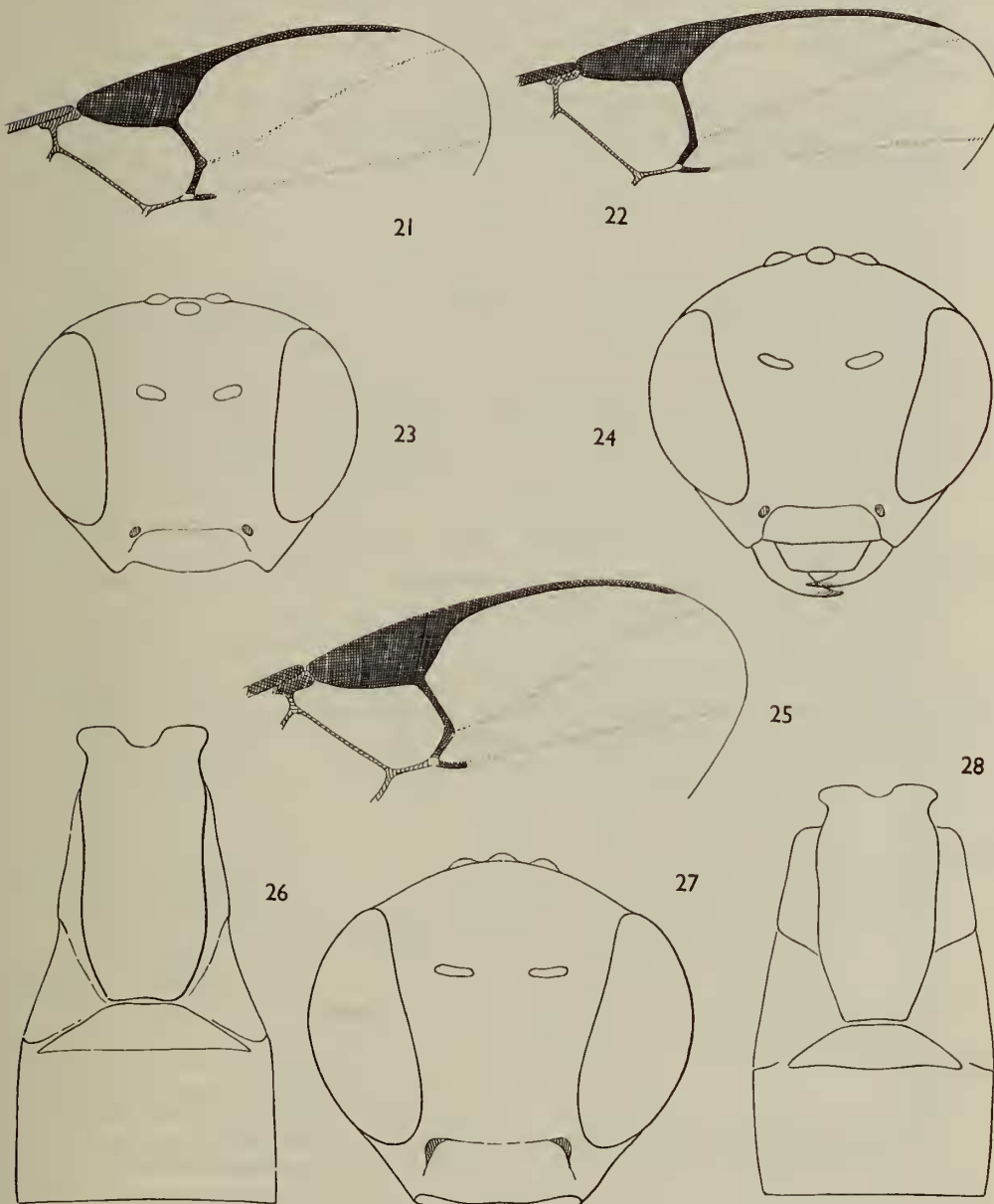


FIGS. 9-20. *Apanteles*, ♀: 9, *opacus* (Ashmead), scutellum, lateral; 10, *niceppe* sp. n., scutellum, dorsal; 11, *painei* sp. n., basal tergites; 12, *crius* sp. n., front tarsus; 13, *niceppe* sp. n., propodeum; 14, *isander* sp. n., hind basitarsus; 15, *saravus* sp. n., hind wing; 16, *angaleti* Muesebeck, basal tergites; 17, *adreus* sp. n., ovipositor sheath, from above; 18, *syleptae* Ferrière, hind wing; 19, *agamedes* sp. n., hind wing; 20, *ater* (Ratzeburg), front tarsus.

- Large sp., ca. 3.5 mm. without ovipositor ; wings markedly brownish with the metacarp fully six times as long as its distance from the apex of the radial cell.
New Guinea *anodaphus* sp. n. (p. 47)
- Punctures at posterior end of notaulic courses either not distinguishable as such because of general rugosity or else smaller and mixed with longitudinal elements to form striate-punctuation 15
- 15 Ovipositor sheath very short, about half as long as the hind tibia.
Hind femur infusate throughout ; front tarsal segment 5 with modified, spine-like hair ; propodeum sharply areolated, the three posterior fields strongly polished. Africa *arsanes* sp. n. (p. 52)
- Ovipositor sheath at least two thirds as long as the hind tibia 16
- 16 Mesoscutum and disc of the scutellum having a dull appearance owing to coarse, more or less even rugosity and without shiny striation at the posterior end of the notaulic courses ; hind coxa dull, rugulose.
Hind femur infusate 17
- Mesoscutum and disc of scutellum having a shiny appearance in spite of heavy sculpture and with shiny striate-punctuation at the posterior end of the notaulic courses ; hind coxa on the whole very shiny 20
- 17 Disc of scutellum everywhere with unusually deep, discrete punctures ; dull, more narrowed behind and more convex here ; 1st abscissa of the radius very obliquely placed on the stigma.
Eyes very strongly convergent below ; areolation of the propodeum not sharply emphasised. Africa *nycon* sp. n. (p. 53)
- Disc of scutellum densely rugose or striate-punctate but without emphasis on a punctate element ; 1st abscissa of the radius placed more nearly at right angles to the stigma 18
- 18 Frons and vertex quite dull, finely rugose ; areolation of propodeum reduced, the costula sometimes not defined ; eyes strongly convergent below ; hind tibia pale only at extreme base. Africa *inaron* sp. n. (p. 53)
- Frons and vertex shiny even if showing feeble rugosity ; areolation of the propodeum complete, the costula well defined ; eyes less strongly convergent ; hind tibia yellow on fully basal half 19
- 19 Metacarp about four times as long as its distance from the apex of the radial cell ; antenna hardly as long as the body, thin, with the preapical segment about one and a half times longer than wide ; hind coxa dull, evenly, finely, densely rugose. Africa to India, including Mediterranean region *hemara* sp. n. (p. 58)
- Metacarp almost closing the radial cell, at least seven times as long as its distance from the apex of the radial cell ; antenna long, powerful, fully as long as the body with the preapical segment only about one and a quarter times longer than wide.
Median field of tergite (2 + 3) less transverse, about two and a half times longer than wide. Africa *sosis* sp. n. (p. 57)
- 20 Tergite 1 markedly narrowed behind, its horizontal part considerably longer than wide.
Median field of tergite (2 + 3) sharply angled laterally at about 30 degrees 21
- Tergite 1 not or hardly narrowed behind, its horizontal part having a quadrate appearance and very slightly wider than long, ca. 11 : 10 ; ovipositor strongly downcurved throughout its entire length. Indo-oriental region *cypris* sp. n. (p. 47)
- 21 Vertex between the posterior ocellus and the eye-margin shining and virtually unsculptured ; temples with only a trace of sculpture ; tergite (2 + 3) usually darkened ; hind wing narrower. Indo-oriental region *opacus* Ashmead (p. 44)
- Vertex here duller and distinctly rugose ; temples with considerable rugosity ; tergite (2 + 3), including the median field, yellow or reddish-yellow ; hind wing broader. Philippines *mamitus* sp. n. (p. 45)

- 22 Ocelli in a higher triangle, the distance between the posterior pair slightly less than twice the diameter of the median ocellus ; hind femur bright yellow on about basal quarter ; tergite (2 + 3) yellow, apart from the median field which is darker ; stigma dark throughout. Philippines *niceppe* sp. n. (p. 45)
- Ocelli in a lower triangle, the distance between the posterior pair being fully twice the diameter of the median ocellus ; hind femur infusate right to base ; tergite (2 + 3) infusate virtually all over ; stigma with pale basal spot, not very distinct. Indo-oriental region *significans* Walker (p. 45)
- 23 Hind femur entirely bright reddish yellow.
Hairs of the ovipositor sheath short, not upstanding 24
- Hind femur infusate at least on apical half 26
- 24 Hind tarsus infusate, except the basitarsus which is sharply pale at base ; segment 4 of the hind tarsus, measured below, hardly shorter than 5.
Ovipositor sheath about as long as the hind tibia. Indo-oriental region
diocles sp. n. (p. 48)
- Hind tarsus yellowish, with at most the apex of the hind basitarsus infusate ; segment 4 of the hind tarsus, thus measured, distinctly shorter than 5.
Horizontal surface of tergite 1 with broad, more or less smooth, medial trough. 25
- 25 Tergite 1 markedly narrowed behind ; ovipositor sheath hardly longer than the hind tibia ; sculpture of the mesopleurum consisting of coarse rugosity ; frons and vertex with much coarse sculpture . Philippines *dores* sp. n. (p. 49)
- Tergite 1 virtually not narrowed behind ; ovipositor sheath fully one and one third times longer than the hind tibia ; sculpture of mesopleurum becoming simple punctation posteriorly ; at least the space between the posterior ocellus and the eye-margin almost smooth and polished. Indo-oriental region
salutifer Wilkinson (p. 48)
- 26 Disc of scutellum dull, closely reticulate-punctate, without any indication of striation, its sculpture exactly like that of the posterior part of the mesoscutum ; very narrow behind and here almost conically raised.
Ovipositor sheath hardly as long as the hind tibia. Africa *antilla* sp. n. (p. 54)
- Disc of the scutellum shiny, feebly punctate or vaguely striate-punctate and its appearance, on the whole, in sharp contrast with the sculpture of the posterior part of the mesoscutum 27
- 27 Ovipositor sheath not or hardly longer than the hind tibia 28
- Ovipositor sheath distinctly longer than the hind tibia 30
- 28 Tergite 1 dull, coarsely, evenly reticulate-rugose ; median field of tergite (2 + 3) equally rugose ; abscissa 1 of the radius very obliquely placed on the stigma (Text-fig. 21). Africa *abdera* sp. n. (p. 50)
- Tergite 1 much more weakly sculptured, shiny and with a more or less clearly defined, longitudinal smooth trough on its horizontal part ; abscissa 1 of the radius placed at right angles to the stigma 29
- 29 Length about 3 mm. without ovipositor ; wings clear hyaline ; hind wing markedly broad (Text-fig. 18). Africa *syleptae* Ferrière (p. 59)
- Length about 2 mm. without ovipositor ; wings faintly brownish ; hind wing decidedly narrow. Philippines *coedicius* sp. n. (p. 46)
- 30 Hind tibia yellow on basal half and more or less in sharp contrast with the infusate apical part ; hind trochanters yellow.
Disc of scutellum polished and with hardly a trace of punctation ; ovipositor sheath hardly one and a quarter times longer than the hind tibia 31
- Hind tibia less sharply yellow on basal half or clearly paler only at extreme base ; hind trochanters dark 32
- 31 Hind femur infusate throughout ; tergite 1 narrow but parallel-sided ; median

field of tergite (2 + 3) not very transverse, about three times as wide as long ; hind coxa dull, rugulose. Africa *mycerinus* sp. n. (fig. 57)



FIGS. 21-28. *Apanteles*, ♀: 21, *abdera* sp. n., front wing, part; 22, *lyridice* sp. n., same; 23, *anatole* sp. n., head, from in front; 24, *metellus* sp. n., same; 25, *novatus* sp. n., front wing; 26, *lyridice* sp. n., basal tergites; 27, *lyridice* sp. n., head, from in front; 28, *mamitus* sp. n., basal tergites.

- Hind femur with infusate cloud only on apical half, more extensive above ; tergite 1 markedly narrowed behind, almost wedge-shaped ; median field of tergite (2 + 3) more transverse, more acutely angled laterally ; hind coxa in greater part polished, shining. Africa *novatus* sp. n. (fig. 57)
- 32 Disc of scutellum superficially striate-punctate ; hairs of the median cell colourless.
Wing glass-clear ; hind wing broad, the length of the 2nd abscissa of the mediella clearly shorter than the distance between its distal extremity and the apex of the vannal lobe as in *syleptae* (Text-fig. 18) ; hind coxa dull, with satin-like sheen. Mauritius *faustina* sp. n. (p. 58)
- Disc of scutellum weakly punctate towards sides ; hairs of the median cell distinctly darkened 33
- 33 Hind tibia pale only at extreme base ; hind tarsus not slender, the basitarsus somewhat wide with conspicuous ventral keel (Text-fig. 14) ; 1st abscissa of the discoideus not at all shorter than the 2nd ; 2nd abscissa of the discoideus more curved ; ovipositor sheath about one and a half times longer than the hind tibia. Africa *isander* sp. n. (p. 59)
- Hind tibia less darkened, the paler basal suffusion extending almost halfway ; hind tarsus very slender, the basitarsus not at all widened and with quite inconspicuous ventral keel ; 1st abscissa of the discoideus distinctly shorter than the 2nd ; 2nd abscissa of the discoideus less curved ; ovipositor sheath about one and a quarter times longer than the hind tibia.
Fore wing brownish ; hind wing rather narrow. Africa *raesus* sp. n. (p. 59)
- 34 Tergite 1 elongate, gradually narrowed from base to apex, hence wedge-shaped ; (Text-fig. 78) its horizontal part distinctly to considerably longer than wide ; claws strongly developed, strongly curved (Text-fig. 77).
Hind femur entirely or almost entirely yellow ; areolation of propodeum strong, complete 35
- Tergite 1 rarely as long as this and then the claws are smaller and less well developed 37
- 35 Mesoscutum shiny, with sharp punctation, but broadly along the middle the punctation is absent, leaving the surface more shiny and more polished.
Disc of scutellum polished, impunctate. Philippines *vacillans* sp. n. (p. 91)
- Mesoscutum dull and with dense punctation that does not fade out along the middle line 36
- 36 Claws less well developed ; disc of scutellum virtually impunctate ; ovipositor sheath as long as the hind tibia. Philippines *dissimile* sp. n. (p. 93)
- Claws more strongly developed (as in *vacillans*) ; disc of scutellum distinctly punctate, more conically raised behind than in *dissimile* ; ovipositor sheath fully one and a quarter times longer than the hind tibia, appearing considerably longer. Philippines *cestius* sp. n. (p. 93)
- 37 Median field of tergite (2 + 3) at most twice as wide as long.
Stigma entirely dark 38
- Median field of tergite (2 + 3) always more transverse than this or, if not, then stigma pellucid 40
- 38 Disc of scutellum distinctly punctate or irregularly pitted, its posterior tip narrowed and with subtruncate posterior face ; hind femur yellow ; median field of tergite (2 + 3) about one and two thirds wider than long ; flagellum of ordinary form 39
- Disc of scutellum polished, posteriorly flattened and without a subtruncate, posterior face ; hind femur in greater part infusate ; median field of tergite (2 + 3) about one and one third times wider than long, polished ; antenna shorter than the body ; flagellum tapering towards apex, clothed with conspicuous, bristly pubescence. Africa *chalconelas* sp. n. (p. 60)
- 39 Hind coxa yellow ; median field of tergite (2 + 3) very coarsely rugose ; disc of

- scutellum with a few, large, ill defined pits or punctures ; tergite 1 hardly narrowed to apex. Fiji Is. *hymeniae* Wilkinson (p. 86)
- Hind coxa blackish ; median field of tergite (2 + 3) faintly dull, with scattered, obsolescent punctures ; disc of scutellum confusedly punctate ; tergite 1 quite strongly narrowed to apex. Malaya *medon* sp. n. (p. 90)
- 40 Ovipositor sheath not or hardly longer than the hind basitarsus 41
- Ovipositor at least distinctly longer than the hind basitarsus, usually much longer 47
- 41 Tergite 1 abruptly narrowed from where it turns over to apex, the median field of tergite (2 + 3) hence very sharply angled laterally at less than 45 degrees and a lateral sulcus fully equal to the apical width of tergite 1 ; areolation of propodeum reduced or almost absent.
- Metacarp not more than four times as long as its distance from the apex of the radial cell 42
- Tergite 1 only slightly narrowed posteriorly or, if strongly so, then the areolation of the propodeum is complete 43
- 42 Costula of propodeum present ; tergite 1 beyond the median field setose all over ; stigma evenly brownish ; ovipositor sheath so short as to be virtually concealed ; no angle between the 1st abscissa of the radius and the transverse cubitus ; tergite 1 rugose. Malaya *prosymna* sp. n. (p. 98)
- Costula absent ; tergite 1 beyond the median field with its setae reduced and more or less restricted to a row along apical margin ; stigma pallid or at most pale brownish with a darker border ; ovipositor sheath projecting more freely than above ; tergite 1 almost smooth, highly polished. Indo-oriental region
- javensis* Rohwer (p. 98)
- 43 1st abscissa of the discoideus forming with the nervulus virtually a straight line.
- Temples very coarsely rugose ; disc of scutellum with large punctures along sides ; tergite 1 short, more or less parallel-sided 44
- 1st abscissa of the discoideus forming with the nervulus an angle at their junction 45
- 44 Stigma pallid ; costula very sharply defined. Indo-oriental region *folia* sp. n. (p. 99)
- Stigma evenly dark brown ; costula more or less wanting *folia* var.? (p. 99)
- 45 Segment 4 of the hind tarsus, measured below, very distinctly shorter than 5 ; metacarp rather short, about three times as long as its distance from the apex of the radial cell ; hind wing broad, the 2nd abscissa of the mediella being very distinctly shorter than the distance between its distal extremity and the apex of the vannal lobe. Malaya *demades* sp. n. (p. 99)
- Segment 4 of the hind tarsus hardly shorter than 5 ; metacarp fully six times as long as its distance from the apex of the radial cell ; hind wing narrower, the 2nd abscissa of the mediella being less obviously shorter than the distance between its distal extremity and the apex of the vannal lobe 46
- 46 Wings not markedly hyaline, the setae dark and the stigma not very pale ; median field of tergite (2 + 3) about two and a half times wider than long (Text-fig. 86) ; inner spur of the hind tibia powerful, reaching distinctly beyond the middle of the hind basitarsus. Philippines *crates* sp. n. (p. 100)
- Wings markedly hyaline, the setae, at least proximal to the areolet, virtually colourless ; median field of tergite (2 + 3) fully four times as wide as long and acutely angled laterally ; inner spur of the hind tibia weak, hardly reaching the middle of the hind basitarsus. Philippines *sartamus* sp. n. (p. 100)
- 47 Ovipositor sheath much shorter than the hind tibia.
- Small spp. ca. 2 mm. without ovipositor 48
- Ovipositor sheath at least about three quarters as long as the hind tibia 52
- 48 Stigma pallid with a faintly darker border 49
- Stigma evenly brown.

Mesoscutum very shiny in spite of its strong punctation ; distance between the

- posterior ocelli distinctly less than the distance between one of them and the eye-margin ; ovipositor sheath about two thirds as long as the hind tibia. Fiji Is.
- daimenes* sp. n. (p. 100)
- 49 Metacarp hardly twice as long as its distance from the apex of the radial cell.
Costula of propodeum absent. Thailand *despectus* sp. n. (p. 103)
- Metacarp at least four times as long as its distance from the apex of the radial cell 50
- 50 Vertex behind the ocelli, and the temples, closely sculptured and dull, the surface sharply contrasting with the polished occiput ; mesoscutum dull, closely, sharply punctate and, seen slightly from in front, appearing silvery owing to close, dense pubescence ; metacarp about four times as long as its distance from the apex of the radial cell. New Guinea *painei* sp. n. (p. 101)
- Vertex and temples more finely sculptured, shiny and not so sharply contrasting with the polished occiput ; mesoscutum much more shiny in spite of its punctation and completely lacking this silvery-grey appearance ; metacarp between five and six times longer than its distance from the apex of the radial cell 51
- 51 Legs, except coxae, virtually entirely yellow ; metacarp about five times as long as its distance from the apex of the radial cell ; ovipositor thick, with abrupt apical attenuation (Text-fig. 83) ; hypopygium evenly sclerotised all over and without lateral creases. Malaya *scultena* sp. n. (p. 101)
- Legs, in addition to the coxae, with at least the hind femur and apical half of the hind tibia deeply infuscate ; metacarp about six times as long as its distance from the apex of the radial cell ; ovipositor less thick and with hardly a trace of such an apical attenuation ; hypopygium membranous at sides and here with longitudinal creases. Fiji Is. *aglaus* sp. n. (p. 66)
- 52 Stigma pallid with a darker border (yellowish in *ater*) 53
- Stigma evenly brown or at most with pale basal spot 84
- 53 Median field of tergite (2 + 3) long, subrectangular, about one and a half times as wide apically as long medially (Text-fig. 80).
Temples very coarsely rugose-punctate ; ovipositor sheath about twice as long as the hind tibia. Java *dictys* sp. n. (p. 90)
- Median field of tergite (2 + 3) never as long as this, at least about twice as wide as long but usually much more transverse 54
- 54 Disc of scutellum with strong punctation at least laterally ; sometimes almost rugose-striate along sides ; strongly narrowed behind and here almost conically raised.
Head coarsely rugose between the posterior ocellus and the eye-margin ; ovipositor sheath about as long as the hind tibia ; costula of the propodeum distinct throughout 55
- Disc of scutellum rarely with as much rugosity as this and then either the costula of the propodeum is absent or ill defined, or the ovipositor sheath is still longer 56
- 55 Hind femur and hind tibia entirely yellow ; cubitellian cell of the hind wing about as long as high ; hairs of the ovipositor sheath all very short and dense ; ovipositor sheath very slightly longer than the hind tibia. Malaya *lanassa* sp. n. (p. 86)
- Hind femur entirely, and the hind tibia at apex, infuscate ; cubitellian cell of the hind wing obviously higher than long ; hairs of the ovipositor sheath longer and more upstanding ; ovipositor sheath as long as the hind tibia. Malaya *goron* sp. n. (p. 89)
- 56 Costula of the propodeum virtually absent 57
- Costula of the propodeum more or less distinctly defined or at least a distinct keel enclosing the spiracle behind 71
- 57 Vertex immediately behind the ocelli with a wide, shallow furrow, which is faintly dull by reason of microscopic, transverse aciculation and which extends longitudinally halfway down the occiput.

- Vertex and temples dull, coarsely rugose-punctate to rugose-reticulate ; tergite 1 not at all narrowed behind. Indo-oriental region . . . *phycodis* Viereck (p. 79)
- Vertex here without such a furrow 58
- 58 Vertex and temples very coarsely rugose-punctate, almost thimble-punctate.
Tergite 1 distinctly to strongly narrowed behind ; hind femur entirely dark ; hind wing broad 59
- Vertex and temples without such coarse sculpture, though the surface may be a little dull and rugulose 61
- 59 Metacarp hardly four times as long as its distance from the apex of the radial cell ; tergite 1 less narrowed behind ; median field of tergite (2 + 3) much less sharply angled laterally, angled at about 45 degrees (Text-fig. 72) ; disc of scutellum highly polished, slightly more narrowed and slightly more conically raised behind ; mesoscutum somewhat shiny in spite of its punctation ; median cell of fore wing very sparsely setose.
Cubitella and mediella of the hind wing unusually widely separated from each other (Text-fig. 76). Indo-oriental region *leptoura* Cameron (p. 88)
- Metacarp at least six times as long as its distance from the apex of the radial cell ; tergite 1 more strongly narrowed behind ; median field of tergite (2 + 3) very sharply angled laterally at about 30 degrees ; disc of scutellum flattened and with vague punctation ; behind, less conically raised and less narrowed ; mesoscutum markedly dull by reason of very dense, coarse punctation 60
- 60 Face coarsely and characteristically rugose-punctate ; ovipositor sheath about one and a half times longer than the hind tibia ; segments 2-5 of the hind tarsus reddish yellow. Philippines *eriphyle* sp. n. (p. 78)
- Face shiny and with only faint traces of punctation but with traces of rugosity towards the antennal sockets ; ovipositor sheath about one and a quarter times longer than the hind tibia ; segments 2-4 of the hind tarsus dark brown and segment 5 yellowish. Philippines *orus* sp. n. (p. 78)
- 61 Edge of vannal lobe virtually not concave ; median field of tergite (2 + 3) distinctly more than half as long as the rest of the tergite.
Costula of the propodeum more or less absent but the three posterior fields showing as highly polished areas ; tergite 1 short, parallel-sided. Philippines *tulis* sp. n. (p. 77)
- Vannal lobe distinctly concave ; median field of tergite (2 + 3) not more than half as long as the rest of the tergite 62
- 62 Head unusually strongly transverse and sharply cut away behind the eyes (Text-fig. 70) ; temples smooth-looking but with vague satin-like sheen.
Ovipositor sheath about one and a half times longer than the hind tibia ; ovipositor itself straight and rather thick. Pakistan *telon* sp. n. (p. 88)
- Head not unusually strongly transverse and not sharply cut away behind the eyes ; temples with distinct though not strong rugose-punctation or fine, even rugosity but in any case without a satin-like sheen 63
- 63 Ovipositor sheath about one and a half times longer than the hind tibia.
Disc of scutellum highly polished 64
- Ovipositor sheath at most about one and one third times longer than the hind tibia 66
- 64 Mesoscutum as long as broad ; tergite 1 virtually parallel-sided ; segments 16-17 of the antenna very distinctly longer than wide.
Face distinctly punctate. Indo-oriental region *araeceri* Wilkinson (p. 76)
- Mesoscutum distinctly transverse ; tergite 1 at least slightly narrowed behind ; segments 16-17 of the antenna not or hardly longer than wide 65
- 65 Thicker spines along the upper part of outer side of hind tibia weaker, less outstanding and not densely crowded ; disc of scutellum somewhat characteristically flattened and widened behind ; tergite 1 markedly narrowed behind (Text-fig. 16), its

- sculpture fine and that within the median hollowed out part on horizontal surface almost scaly-reticulate ; propodeum with fine, dull, even sculpture ; areola hardly defined. India **angaleti** Muesebeck (p. 76)
- Thicker spines along the upper part of outer side of hind tibia strong, sharp, densely crowded ; disc of scutellum narrower behind ; tergite 1 hardly narrowed behind ; propodeum smoother, more shiny. Philippines **nephereus** sp. n. (p. 76)
- 66 Entire head, including a large area immediately behind the ocelli dull and appearing greyish owing to excessively fine pubescence superimposed on a fine rugosity ; mesoscutum completely dull owing to extremely fine, dense, rugose-punctuation ; disc of scutellum flattened and rather wide behind with somewhat coarse, uneven punctuation. Philippines **cebes** sp. n. (p. 80)
- Head of ordinary appearance and shiny black though with distinct rugosity at temples ; mesoscutum not so evenly dull as this ; disc of scutellum polished except for faint trace of sculpture along sides 67
- 67 Tergite 1 hardly narrowed behind, almost parallel-sided ; ovipositor not, or hardly, longer than the hind tibia 68
- Tergite 1 very distinctly narrowed behind (not so much in *murcia*) ; ovipositor sheath at least about one and a quarter times longer than the hind tibia 69
- 68 Ovipositor sheath distinctly longer than the hind tibia ; spines along upper part of outer side of hind tibia more numerous, closer ; distance between the posterior ocelli not greater than the distance between one of them and the eye-margin. India **tachardiae** Cameron (p. 72)
- Ovipositor sheath not longer than the hind tibia ; spines along upper part of outer side of hind tibia sparser, finer, less close ; distance between the posterior ocelli distinctly greater than the distance between one of them and the eye-margin. India **machaeralis** Wilkinson (p. 72)
- 69 Propodeum on each side of the areola polished, smooth, there being no trace of an areola or keel behind the spiracle ; ovipositor sheath about one and a quarter times longer than the hind tibia. India **importunus** Wilkinson (p. 73)
- Propodeum on each side of the areola (this often poorly defined) with rugosity at least in the place normally occupied by the costula ; ovipositor sheath fully one and one third times longer than the hind tibia 70
- 70 Upper part of the convexity of the mesopleurum with more distinctly discrete punctuation on a polished, smooth surface ; face very distinctly but rather finely punctate ; ovipositor very thin ; horizontal part of tergite 1 longer than wide. India **oritias** sp. n. (p. 68)
- Upper part of the convexity of the mesopleurum with coarse rugose-punctuation on a rather dull surface ; face much less distinctly punctate ; ovipositor a little thicker ; horizontal part of tergite 1 slightly transverse. Malaya **murcia** sp. n. (p. 73)
- 71 Temples shiny, almost smooth.
Antenna about as long as the body ; hind wing narrow ; propodeum with complete, sharp areolation ; tergite 1 long, narrow 72
- Temples rugulose and usually dull 73
- 72 Hind tibia and hind tarsus evenly brownish ; spines of the outer side of the hind tibia virtually not differentiated into two types and all of them sparse ; hind spurs rather short, the inner one hardly longer than the outer one ; ovipositor sheath fully as long as the hind tibia ; vannal lobe not concave, its edge with an occasional projecting hair (Text-fig. 15) ; head deep from back to front. Philippines **saravus** sp. n. (p. 81)
- Hind tibia yellowish on more than basal half ; hind basitarsus yellowish at base ; spines of the outer side of the hind tibia differentiated into two types, much denser than in *saravus* ; hind spurs longer, the inner one much longer than the outer one ;

- ovipositor sheath about three quarters as long as the hind tibia ; vannal lobe distinctly concave, without projecting hairs. Philippines *coedictus* sp. n. (p. 46)
- 73 Mesoscutum unusually coarsely rugose, the lines of the notaulices broad and very coarsely punctate-rugose.
Head above with coarse shiny sculpture but the temples without clear punctation ; ovipositor sheath slightly shorter than the hind tibia. China
florus sp. n. (p. 49)
- Mesoscutum showing normal rugosity, the lines of the notaulices not as coarsely rugose as this, or if the sculpture appears to approach the condition found in *florus*, then the ovipositor sheath is much longer (*ortia*) 74
- 74 Ovipositor unusually thick (Text-fig. 56), straight except at apex ; median field of tergite (2 + 3) highly polished, hardly twice as wide as long.
Mesoscutum almost evenly reticulate-punctate ; ovipositor sheath almost one and a half times longer than the hind tibia. Solomons *ortia* sp. n. (p. 81)
- Ovipositor never as straight as this, nor as thick ; if markedly thickened (*clita*), then more or less curved throughout ; median field of tergite (2 + 3) more transverse than this 75
- 75 Tergite 1 hardly narrowed behind (Text-fig. 42) 76
- Tergite 1 very distinctly narrowed behind.
Median field of tergite (2 + 3) very short, with sharply angled lateral corners ; hind femur deeply infuscate 79
- 76 Hind femur bright yellow ; hind tibia almost whitish yellow with faint apical infuscation ; median and submedian cells of the fore wing very densely setose, the setae obviously brown ; small sp. ca. 2.4 mm. without ovipositor.
1st abscissa of the radius and the transverse cubitus subequal, rather thick and angled at their junction. Malaya *psenes* sp. n. (p. 80)
- Hind femur blackish throughout ; hind tibia much darker, being infuscate at least on apical half ; median and submedian cells more sparsely setose, the setae on the whole pale to colourless ; larger spp., ca. 2.8 mm. without ovipositor 77
- 77 Entire hind tarsus blackened ; punctation at posterior end of notaulic course very strong and without obvious longitudinal elements
Vertex behind the ocelli rather strongly rugose and with faint traces of transverse aciculation ; metacarp about four times as long as its distance from the apex of the radial cell. Queensland *oenone* sp. n. (p. 69)
- At least segments 2-4 of the hind tarsus yellow ; punctation at posterior end of notaulic course much finer and mixed with longitudinal elements 78
- 78 Apical segment of the hind tarsus reddish yellow ; metacarp about five times as long as its distance from the apex of the radial cell ; tergite 1 almost smooth, strongly shining ; ovipositor sheath distinctly longer than the hind tibia ; ovipositor very thin. Malaya *contemptus* sp. n. (p. 72)
- Apical segment of the hind tarsus blackened ; metacarp about four times as long as its distance from the apex of the radial cell ; at least the horizontal surface of tergite 1 quite strongly rugose ; ovipositor sheath not longer than the hind tibia ; ovipositor thicker. India *sauros* sp. n. (p. 70)
- 79 Vertex behind the ocelli with extremely fine, on the whole smooth, transverse aciculation.
Ovipositor considerably thickened (Text-fig. 53) ; ovipositor sheath slightly longer than the hind tibia. India *clita* sp. n. (p. 67)
- Vertex here rugose and with at most faint traces of broken, transverse aciculation and then the ovipositor sheath is very distinctly longer than the hind tibia 80
- 80 Tergite 1 highly polished, its horizontal surface strongly narrowed to apex and virtually without trace of sculpture.

- Very small sp., ca. 1.8 mm. without ovipositor ; costula of propodeum wanting ; ovipositor sheath not longer than the hind tibia. Sumatra . *schneideri* sp. n. (p. 103)
- Tergite 1 always considerably sculptured.
Larger spp., at least 2.2 mm. without ovipositor. 81
- 81 Antenna shorter, with the preapical segments very tightly articulated and segments 16-17 not longer than wide ; thicker spines of the outer side of the hind tibia short and somewhat blunt.
Vertex behind the ocelli almost smooth ; ovipositor sheath very slightly longer than the hind tibia. Philippines *smerdis* sp. n. (p. 68)
- Antenna longer, with the preapical segments less tightly articulated and segments 16-17 distinctly longer than wide ; thicker spines of the outer side of the hind tibia longer, sharply pointed 82
- 82 Ovipositor sheath very distinctly longer than the hind tibia ; mesoscutum duller ; hind spurs longer and thicker ; temples more strongly sculptured ; areolation of propodeum weak with costula poorly indicated.
Hind tarsus infuscate throughout. India *cerberus* sp. n. (p. 69)
- Ovipositor sheath a little shorter than the hind tibia ; mesoscutum shiny, its sculpture superficial ; hind spurs shorter ; temples less strongly sculptured ; areolation of propodeum somewhat weaker with the costula still more poorly defined 83
- 83 Stigma more or less evenly brownish-yellow ; front tarsus very short, segment 2 being hardly longer than wide ; front tarsal segment 5 with a distinct spine (Text-fig. 20) ; head less transverse ; temples more finely roughened, with dull, satin-like-sheen. Europe *ater* Ratzeburg (p. 74)
- Stigma pellucid ; front tarsus normal, segment 2 being very obviously longer than wide ; front tarsal segment 5 without a spine ; head more transverse ; temples more noticeably roughened. Indo-oriental region *taragamae* Viereck (p. 66)
- 84 Vannal lobe beyond its widest part not in the least concave and with a complete or almost complete fringe of hairs, or at any rate, with a few projecting hairs (except *racilla*) 85
- Vannal lobe beyond its widest part more or less distinctly concave and here without trace of a fringe of hairs or even an occasional projecting hair, except at apex.
The vannal lobe is hardly concave in *adreus* but this species has strongly shortened flagellum 97
- 85 Hind wing narrow, the length of the 2nd abscissa of the mediella about equal to the distance between its distal extremity and the apex of the vannal lobe (Text-fig. 15).
Cubitellan cell of the hind wing very distinctly longer than wide ; wings distinctly brownish ; median cell evenly and densely setose all over 86
- Hind wing broader, the 2nd abscissa of the mediella not longer than the distance between its distal extremity and the apex of the vannal lobe (Text-fig. 19).
Wings hyaline or nearly so ; vannal lobe roundly angled at its widest part ; tergite 1 large, broad, not or hardly narrowed behind, densely, evenly rugose ; disc of scutellum punctate towards sides 95
- 86 Metacarp short, between two and two and a half times longer than its distance from the apex of the radial cell (Text-fig. 31).
Ocelli in a high triangle, the transverse, posterior tangent to the anterior ocellus not touching the posterior pair ; mesoscutum heavily punctate, the punctures less crowded and with shiny interspaces along the middle line ; virtually no trace of longitudinal elements at the posterior end of the notaulic courses. Africa to Australia and the Philippines *argiope* sp. n. (p. 85)
- Metacarp longer, at least three times as long as its distance from the apex of the radial cell 87

- 87 Edge of vannal lobe beyond its widest part with a more or less complete fringe of hairs.
Face with distinct punctation 88
- Edge of vannal lobe beyond its widest part with at most a few hardly visible, slightly projecting hairs.
Hind coxa in greater part infusate 89
- 88 Face dull, densely and very obviously punctate ; ocelli in a high triangle, the transverse, posterior tangent to the median ocellus passing far in front of the hind pair ; hind coxa blackish ; punctures densely crowded along the notaulic courses and forming dull bands. China *dryas* sp. n. (p. 85)
- Face shiny and with only a faint punctation ; ocelli in a lower triangle, this tangent almost touching the posterior pair ; hind coxa yellow ; these punctures, though slightly larger than elsewhere on the mesoscutum, much less crowded and not forming dull bands along the notaulic courses. New Hebrides
coretas sp. n. (p. 85)
- 89 Mesopleurum in the oblique direction sufficiently hollowed out to form a discrete, linear sternaulus 90
- Mesopleurum in the oblique direction merely hollowed out in the manner common to most species.
Head from above almost subquadrate ; posterior end of the notaulic courses indicated by a zone of shiny striate-punctation ; stigma brownish-yellow. Philippines *saravus* sp. n. (p. 81)
- 90 Mesoscutum shiny with a heavy, discrete punctation.
Face smooth, shining ; vertex around the ocelli highly polished ; sternaulus showing traces of rugosity towards the wing insertions 91
- Mesoscutum much more densely punctate, duller, the punctures so crowded on anterior half as to render the surface, at first sight, finely rugose.
Sternaulus much more sharply discrete and rugose more or less throughout 93
- 91 Metacarp between four and five times as long as its distance from the apex of the radial cell 92
- Metacarp fully six times as long as its distance from the apex of the radial cell.
Eyes large, close together on face ; hind femur and hind tibia reddish yellow ; hind tibia faintly infusate at apex. Borneo *usipetes* sp. n. (p. 81)
- 92 Punctures of mesoscutum unusually large for the size of the insect, hardly more crowded at posterior end of notaulic courses and here tending to fade out ; eyes markedly convergent.
Hairs of the ovipositor sheath standing out almost at right angles. New Hebrides *stenotelas* sp. n. (p. 82)
- Punctures of mesoscutum smaller and closer but the general surface much as in *stenotelas*, very shiny with the punctures tending to fade out posteriorly ; eyes considerably less convergent.
Ocelli in a slightly lower triangle, the posterior tangent to the anterior ocellus almost touching the posterior pair. New Hebrides *pisenor* sp. n. (p. 82)
- 93 Antenna as long as the body ; face shining, impunctate ; hind coxa yellowish on apical half. Philippines *elagabalus* sp. n. (p. 84)
- Antenna shorter than the body, face finely punctate ; hind coxa infusate throughout.
Apical segments of antenna closely articulated, the flagellum decidedly thick 94
- 94 Stigma broad (Text-fig. 63) ; eyes normal ; face paler around the antennal insertions. W. Indies. Africa. Malaya *piceoventris* Muesebeck (p. 82)
- Stigma normal ; eyes considerably narrowed (Text-fig. 60) ; face evenly darkened. British Isles *trachalus* sp. n. (p. 84)
- 95 Propodeum with complete areolation, the costula strongly developed ; vannal lobe beyond its widest part with complete, though extremely short fringe (Text-fig. 19).

- Hind femur yellow except for faint apical infuscation ; hind tibia sharply blackened at tip ; disc of scutellum thickly punctate, the punctures smaller towards sides. Mauritius *agamedes* sp. n. (p. 91)
- Propodeum without complete areolation, the costula not or hardly distinguishable from the surrounding rugae ; vannal lobe beyond its widest part at first sight bare, at most with widely separated, minute, projecting hairs.
- Mesoscutum with dull, densely rugose sculpture and without longitudinal elements at the posterior end of the notaulic courses 96
- 96 Hind femur bright yellow but becoming infusate towards apex above ; ovipositor sheath shorter, nearer to one and one third times longer than the hind tibia ; mesopleurum with a more sharply defined, more extensively rugose sternaulus ; hind tibia with more extensive apical infuscation ; edge of vannal lobe with an occasional projecting hair. Africa *anatole* sp. n. (p. 54)
- Hind femur reddish-yellow with only the merest trace of apical infuscation ; ovipositor sheath longer, nearer to one and half times longer than the hind tibia ; mesopleurum with a less sharply discrete, less rugose sternaulus ; hind tibia infusate only at extreme apex ; edge of vannal lobe without trace of projecting hairs. Africa *racilla* sp. n. (p. 55)
- 97 Antenna exceptionally short, hardly longer than head plus thorax and with segments 12–17 almost transverse.
- Areolation of the propodeum incomplete, the costula wanting 98
- Antenna never as short as this, at least segment 12 being clearly longer than wide 99
- 98 A brownish cloud beneath the stigma ; ovipositor sheath about two thirds as long as the hind tibia ; ovipositor with abrupt apical constriction (Text-fig. 67). Sumatra *aglaope* sp. n. (p. 61)
- No such cloud beneath the stigma ; ovipositor sheath much longer than the hind tibia ; ovipositor without an obvious apical constriction. Africa *adreus* sp. n. (p. 61)
- 99 Ocelli in a high triangle, the transverse, posterior tangent to the anterior ocellus not touching the posterior pair.
- Hind wing narrow ; areolation of propodeum incomplete or more or less wanting 100
- Ocelli in a low triangle, the posterior tangent to the anterior ocellus cutting or, at any rate, virtually touching the posterior pair 103
- 100 Propodeum dull, densely rugose all over and without areolation, there being no smoothing of the surface to indicate the posterolateral areas and hardly a trace of an areola ; hind femur yellow ; face dull, sharply punctate.
- Tergites (2 + 3)–6 thickly hairy all over. Queensland *aper* sp. n. (p. 62)
- Propodeum much less dull, the postero-lateral areas being more or less indicated by a fading out of sculpture and the areola sharply defined ; hind femur blackish or brownish ; face shiny, impunctate 101
- 101 Tergites (2 + 3)–6 with hairs reduced more to less to a single row ; abscissa 1 of the radius more or less at right angles to the stigma ; mesopleurum without rugose sternaulus ; hind femur virtually black 102
- Tergites (2 + 3)–6 hairy all over ; abscissa 1 of the radius very obliquely placed on the stigma ; mesopleurum with wide, trough-like sternaulus filled with irregular striation ; hind femur brown. Africa *parsodes* sp. n. (p. 60)
- 102 Ovipositor sheath markedly longer than the hind tibia ; cubitellan cell of the hind wing longer, more or less parallel-sided ; antenna longer, segment 14 being about twice as long as wide. Queensland *vala* sp. n. (p. 62)
- Ovipositor sheath hardly as long as the hind tibia ; cubitellan cell of the hind wing shorter, distinctly narrowed apically ; antenna shorter, segment 14 being about one and one third times longer than wide. Queensland *fundulus* sp. n. (p. 64)
- 103 Tergite 1 long, narrow, strongly narrowed distally, its horizontal part at least one

and a half times longer than its middle width (across hump).

Disc of scutellum strongly narrowed behind, its tip subtruncate in profile (cf. text-fig. 9) ; areolation of propodeum strong, complete ; hind femur blackish .

- 104 - If the shape of tergite 1 approaches above description, then either the costula of the propodeum is more or less wanting or the hind femur is yellow 105
- 104 Disc of scutellum varying from confusedly punctate to quite densely striate-punctate ; spiracle of propodeum of normal size, its longer diameter not more than half the length of the fork of the costula enclosing it behind. Indo-oriental region
significans Walker (p. 45)
- Disc of scutellum highly polished ; spiracle of the propodeum large, its longer diameter more than half the length of the fork of the costula enclosing it behind. Temples strongly rugose-punctate. Java *erse* sp. n. (p. 89)
- 105 Hind femur entirely yellow or at most with apical infuscation 106
- Hind femur blackish or (rarely) reddish-brown 111
- 106 Vertex between the ocelli and the eye-margin very strongly punctate, almost thimble-punctate. Face very sharply punctate 107
- Vertex here with at most feeble punctation, not describable as thimble-punctuation . 109
- 107 Tergite 1 virtually not narrowed behind ; a lateral sulcus of the median field of tergite (2 + 3) less than half as long as the apical width of tergite 1. Ovipositor sheath about one and a half times longer than the hind tibia ; disc of scutellum a little dull and with ill defined punctation, especially towards sides. Africa *rutilans* sp. n. (p. 55)
- Tergite 1 distinctly narrowed behind ; lateral sulcus of the median field of tergite (2 + 3) at least half as long as the apical width of tergite 1. Lateral corners of the median field of tergite (2 + 3) sharply angled at about 30 degrees 108
- 108 Hind tibia and hind tarsus entirely yellow ; venation not unusually darkened ; flagellum of ordinary form, not bristly ; antennal segment 15 about one and a half times longer than wide ; flange beneath the hind tarsal segments not deep and not conspicuous. India *rugiceps* Wilkinson (p. 94)
- Hind tibia infusate at apex and the hind tarsus infusate more or less throughout ; venation very dark ; flagellum conspicuously bristly ; antenna long, tapering with segment 15 fully twice as long as wide ; flange beneath the hind tarsal segments deep and conspicuous. Disc of scutellum sharply punctate, except medially. Philippines
townesi sp. n. (p. 79)
- 109 Tergite 1 strongly, abruptly narrowed to apex, shiny and only feebly sculptured ; wings markedly and evenly embrowned ; spines along upper part of outer side of hind tibia short, stubby, very dense (Text-fig. 30). Ovipositor sheath hardly one and a quarter times longer than the hind tibia. Java *cocotis* Wilkinson (p. 94)
- Tergite 1 more or less parallel-sided, its horizontal part with considerable rugosity ; wings hyaline or nearly so ; spines here long, finer and not dense 110
- 110 Propodeum with three polished fields, its areolation more or less complete ; horizontal part of tergite 1 with a broad, smooth trough ; wings hyaline with the setae of the median cell colourless. Indo-oriental region . *salutifer* Wilkinson (p. 48)
- Propodeum dull, considerably rugose, lacking these polished fields because the costulae are wanting ; horizontal part of tergite 1 without a median, smooth trough ; wings faintly brownish, the setae of the median cell darkened. Philippines *chloris* sp. n. (p. 77)
- 111 Tergite 1 not or hardly narrowed behind, more or less quadrate or even slightly widened behind 112

- Tergite 1 obviously narrowed behind 117
- 112 Postero-lateral area of the propodeum bounded laterally by a fine keel that runs almost parallel with the true lateral margin; these two keels enclose a narrow, longitudinal area (Text-fig. 61).
 Antenna short; mesoscutum densely punctate and posteriorly with two large, dull zones of denser sculpture; mesopleurum with deep, rugose-striate sternaulus; tergite 1 large, subquadrate (Text-fig. 59). Cosmopolitan
- carpatus* Say (p. 75)
- Postero-lateral area of the propodeum without such a keel 113
- 113 Metacarp only a little longer than its distance from the apex of the radial cell; propodeum very smooth-looking and without areolation; at most a weakly indicated areola present; punctuation of the mesoscutum very weak.
 Ovipositor sheath a little shorter than the hind tibia. Australia
- ippeus* sp. n. (p. 96)
- Metacarp much longer than its distance from the apex of the radial cell; propodeum with costula present even if weak; if not, then surface with coarse rugosity or strong, irregular rugae everywhere; mesoscutum with sharp punctuation; this punctuation sometimes coarse and strong 114
- 114 Temples very sharply thimble-punctate.
 Gaster with dull, satin-like sheen; ovipositor sheath wide, slightly shorter than the hind tibia; tergite 1 short, subquadrate. India. Java *aristaeus* sp. n. (p. 95)
- Temples shining and with at most an obsolescent punctuation 115
- 115 Gaster beyond tergite 1 highly polished; tergites (2 + 3)-6 with hairs reduced virtually to a single row; a weakly rugose-costate groove extends downwards from the dorsal furrow of the mesopleurum into the mesopleural depression 116
- Gaster lacking this polished appearance, having a satin-like sheen; tergites (2 + 3)-6 with hairs scattered more or less all over their surface; no such groove present on mesopleurum.
 Horizontal part of tergite 1 transverse; median field of tergite (2 + 3) from four to five times as wide as long. Africa. Philippines *cyprionides* sp. n. (p. 48)
- 116 Punctures on anterior part of mesopleurum large, subconfluent; 1st abscissa of the discoideus slightly longer than the 2nd; antenna longer, segments 16-17 being slightly longer than wide; stigma wider; metacarp slightly shorter. Australia
- persephone* sp. n. (p. 65)
- Punctures on anterior part of mesopleurum smaller, sharper and discrete; 1st abscissa of the discoideus very slightly shorter than the 2nd; antenna slightly shorter, segments 16-17 being almost transverse; stigma narrower; metacarp slightly longer (Text-fig. 65). Solomon Is. Fiji Is. *pertiades* sp. n. (p. 64)
- 117 Propodeum with complete areolation or, if the costula is hardly indicated, then the ovipositor sheath is fully as long as the hind tibia. 118
- Propodeum without complete areolation, there being virtually no trace of a costula or, if one is feebly indicated, then the sheath of the ovipositor is distinctly shorter than the hind tibia 120
- 118 Mesoscutum dull, densely, evenly punctate; disc of scutellum with large, shallow, indistinct punctures; antenna longer with segments 16-17 obviously longer than wide; spines on the outer side of the hind tibia sparse and not noticeably reddish. Philippines *assis* sp. n. (p. 96)
- Mesoscutum more shiny, its punctuation less dense; disc of scutellum virtually polished and impunctate; antenna short, thick, with segments 16-17 not longer than wide; spines along upper part of outer side of hind tibia strong, reddish, very dense.
 Stigma unusually broad (Text-fig. 66) 119
- 119 Middle lobe of the mesoscutum very strongly shining, its punctuation along the

middle line, especially posteriorly, tending to fade out ; costula of propodeum strongly developed ; median field of tergite (2 + 3) less transverse (Text-fig. 46).

Indo-oriental region *tirathabae* Wilkinson (p. 65)

- Middle lobe of the mesoscutum less shining, densely punctate all over ; costula of the propodeum more or less wanting ; median field of tergite (2 + 3) more transverse. Cosmopolitan *galleriae* Wilkinson (p. 75)

- 120 The polished black occipital region reaches as far as the posterior ocelli (not even a zone of pubescence behind the ocelli) ; thicker spines along upper part of outer side of hind tibia short, stubby, deeply reddish.

Hind tibia and hind tarsus virtually black throughout ; ovipositor sheath about one and a half times longer than the hind tibia ; ovipositor itself very thin.

Philippines *galatea* sp. n. (p. 97)

- The polished or smooth-looking occipital region is separated from the posterior ocelli by a zone of sculpture, sometimes very fine, or at any rate, by a zone of pubescence ; thicker spines along upper part of outer side of hind tibia more upstanding, not stubby 121

- 121 Propodeum on each side of the areola polished, and virtually smooth ; without rugae in the place normally occupied by the costula 122

- Propodeum on each side of the areola with numerous rugae 123

- 122 Temples and vertex behind the ocelli with sharp punctation, the punctures immediately adjacent to the impunctate occiput particularly sharp and discrete ; occipital region dull with a satin-like sheen ; ovipositor sheath hardly one and a quarter times longer than the hind tibia. Ceylon. Philippines *dotus* sp. n. (p. 94)

- Temples finely roughened ; vertex behind the ocelli almost as smooth as the occipital region except for fine pubescence ; occipital region polished black ; ovipositor sheath hardly one and a quarter times longer than the hind tibia.

Africa *sagax* Wilkinson (p. 73)

- 123 Vertex between the ocelli and the eye-margin and also the temples, almost thimble-punctate 124

- Vertex at most finely roughened ; temples at most with fine rugosity 125

- 124 Ovipositor sheath about one and a half times longer than the hind tibia ; hind tarsus with segments 2-5 reddish yellow. Philippines . . . *eriphyle* sp. n. (p. 78)

- Ovipositor sheath about as long as the hind tibia ; hind tarsus deeply infuscate throughout.

Hind wing less broad. Sumatra *tigasis* sp. n. (p. 78)

- 125 Vertex behind the ocelli with fine, transverse aciculation, the width of the aciculate area in the longitudinal direction being about equal to the distance between the posterior ocelli.

Ovipositor unusually thick, its sheath distinctly longer than the hind tibia ; costula of the propodeum hardly or not at all indicated. India

metagenes sp. n. (p. 67)

- Vertex behind the ocelli never thus aciculated 126

- 126 Ovipositor sheath nearly one and a half times longer than the hind tibia.

An irregularly costate furrow extends downwards from the area of rugosity beneath the wing insertions into the mesopleural depression 127

- Ovipositor sheath distinctly shorter than the hind tibia.

Small sp., ca. 2 mm. ; ovipositor thick with well marked apical constriction.

India *stennos* sp. n. (p. 68)

- 127 Antenna thick with segments 15-17 square in outline ; disc of scutellum rather wide and flattened behind ; hind tarsus not particularly long and thin. Sumatra

ariovistus sp. n. (p. 97)

- Antenna not at all thick, slightly tapered towards apex and with segments 15-17 distinctly longer than wide ; disc of scutellum narrower behind, less flattened

here ; hind tarsus unusually long and thin, about one and half times longer than the hind tibia.

Metacarp slightly shorter than in *ariovistus*. Malaya . . . *solox* sp. n. (p. 97)

Apanteles cavifrons sp. n.

♂ ♀. Hind femur dull brownish red with the hind tibia reddish on basal two thirds but becoming as dark apically as the femur.

♀. Vertex between the posterior ocellus and the eye-margin shining and almost smooth. Eyes fairly strongly convergent, as in *lyridice* (cf. Text-fig. 27). Antenna about as long as the body with segment 17 fully one and one third times longer than wide.

Mesoscutum dull, coarsely punctate ; posterior end of notaulic course virtually without longitudinal elements. Scutellum closely, almost coarsely punctate. Areolation of the propodeum very strong. Setae of the medial cell dense, brown ; metacarp at least six times longer than its distance from the apex of the radial cell, almost closing the radial cell. Hind coxa shiny, almost smooth.

Median field of tergite (2 + 3) angled laterally at about 30 degrees. Ovipositor sheath slightly shorter than the hind tibia.

Length: ca. 3.3 mm. without ovipositor.

PHILIPPINES : Los Baños, 8 ♀♀, one the *TYPE*, 8 ♂♂ ; Luzon, Mt. Makiling, 1 ♀, 1 ♂. (All *Baker*).

Type in the U.S. National Museum.

A most distinct species on account of the structure of the frons ; in no other species of *Apanteles* have I met with such an excavation.

Apanteles opacus (Ashmead)

Urogaster opacus Ashmead, 1905 : 118.

Apanteles opacus (Ashmead) Wilkinson, 1928a : 128.

♀. Tergite (2 + 3) darkened all over (Philippines) but sometimes markedly yellow (Sandakan, India, Buitenzorg, I. of Penang, Japan). Only basal quarter of hind femur yellow in specimens from Philippines ; more than half yellow (India and Japan) and almost entirely yellow in a single female from I. of Penang.

Face shining and only with very superficial punctation.

Mesoscutum rather shiny in spite of its strong punctation ; course of notaulices showing as a coarsely rugose band that posteriorly widens into an area of conspicuous striate-punctation. Disc of scutellum shiny and covered with ill defined pits. Hind wing decidedly narrow ; stigma less elongate than in *cavifrons*.

Hairy part of ovipositor sheath about three quarters as long as the hind tibia.

Length: 3 mm. without ovipositor.

PHILIPPINES : Los Baños ; Luzon, Mt. Makiling & Mt. Limay ; Mindanao, Surigao ; Davao ; Manila. MALAYA : I. of Penang. JAPAN : Kobe. 24 ♀♀. (All coll. *Baker*). INDIA : United Provinces, Dehra Dun, x.1935, 3 ♀♀, bred from *Pachyzancla stultalis* ; Mysore, Bangalore, 1 ♀, bred from *Pericallia ricini*. JAVA : Buitenzorg, 1 ♀, bred from larva on *Amaranthus*.

Type in U.S. National Museum.

Host : *Pachyzancla stultalis* Walker (Pyralidae) ; *Pericallia ricini* F. (Arctiidae).

In general appearance this species is exactly like *cavifrons*.

Apanteles mamitus sp. n.

♀. Could be confused only with *opacus* to which it is very closely related.

The brown hind femur is pale at extreme base as in the majority of the examples of *opacus* I have examined. The wings are more nearly hyaline with the hind wing clearly broader.

Face much more distinctly punctate than in *opacus*.

Tergite 1 considerably narrower (Text-fig. 28). Sheath of ovipositor shorter, about two thirds as long as the hind tibia.

PHILIPPINES : Angono, Rizal, 11.i.1953, 1 ♀, the *TYPE*, (*M. & D. Townes*) ; Luzon, Mt. Makiling, 1 ♀, (*Baker*) ; Manila, 1 ♀, (*Brown*).

Type in Coll. Townes.

The most obvious character for separating this species from *opacus* seems to be its narrower first tergite.

Apanteles niceppe sp. n.

♀. In general appearance this species is more like *mamitus* than *opacus*, though it is very closely related to both. It may be compared with *opacus* as follows:

Eyes showing the same degree of convergence as in *opacus* and with equally shiny, very weakly punctate face.

Scutellum (Text-fig. 10).

Posterior corners of propodeum showing as more prominent, slightly more widened projections (Text-fig. 13). Hind wing slightly broader.

Tergite 1 narrower, its horizontal surface more noticeably channelled ; the furrow sharply margined, especially anteriorly. Ovipositor sheath fully as long as the hind tibia.

PHILIPPINES : Benaue, Mt. Prov. 1.i.1954, 2 ♀♀, one the *TYPE*, 30.xii.1953, 1 ♀, (*M. & D. Townes*).

Type in Coll. Townes.

This species resembles *mamitus* in colour but differs from it in lacking the rugosity of the temples and in having a much longer ovipositor.

Apanteles significans (Walker)

Microgaster significans Walker, 1860 : 308.

Apanteles significans (Walker) Wilkinson, 1932 : 337. [In key]

♀. Closely related to *opacus* and its allies.

Eyes as convergent below as in *opacus* but the face with more distinct punctuation. Wings glassy hyaline with the setae of the medial cell colourless.

Mesoscutum a little less shining ; posterior end of notaulic courses with less evident longitudinal elements. Disc of scutellum usually strongly striate-punctate, more especially towards sides. Hind wing decidedly broader ; metacarp of fore wing not reaching so close to the apex of the radial cell ; abscissa 1 of the radius much longer than the transverse cubitus and not angled at its junction with this.

Tergite 1 considerably more narrowed behind, its horizontal part longer and with only a very feeble median channel, sometimes hardly indicated.

INDIA. PAKISTAN. CEYLON. MALAYA : Singapore. PHILIPPINES : Los Baños, Luzon, Mindañao.

Type in the British Museum (Nat. Hist.).

Host : *Sylepta derogata* Fab. (Pyraustidae).

Like *opacus* and its close allies, this species has the mesosternum deeply channelled with its lobes convex on each side of the channel.

A. significans bears a strong resemblance to the African *syleptae*, which parasitises the same host. It differs from *syleptae* as follows :— Eyes more distinctly convergent below ; face distinctly punctate ; 1st abscissa of the radius much longer in proportion to the length of the transverse cubitus ; ovipositor sheath a little longer.

Apanteles coedicius sp. n.

♀. May be compared with *opacus* as follows:—

Eyes hardly convergent. Face broad, shiny, almost polished and with only a trace of very superficial punctation. Segment 17 of the antenna about one and half times longer than wide.

Mesoscutum appearing contrastingly dull by comparison with the smooth, shiny top of head ; duller, more evenly and closely punctate than in *opacus*. Disc of scutellum polished and with virtually no trace of punctation. Stigma slightly more elongate than in *opacus* and metacarp reaching even closer to apex of radial cell.

Length: ca. 2 mm. without ovipositor.

PHILIPPINES : Los Baños, 1 ♀, the *TYPE*, (*Baker*).

Type in U.S. National Museum.

The smallest of the species allied to *opacus*. Apart from size and duller mesoscutum, extremely like *opacus*.

Apanteles lyridice sp. n.

♀. Hind femur yellow but darkened above on about apical half ; hind tibia dark brown but paler beneath towards base and with complete pale basal ring ; hind tarsus brown throughout. Tergite (2 + 3) in great part yellow but the median field dark brown with median patch of infuscation adjacent to it posteriorly.

Head deep from back to front, smooth above and with faint satin-like sheen. Eyes strongly convergent (Text-fig. 27). Face smooth and with hardly a trace of punctation. Antenna long with segment 17 about one and half times longer than wide.

Sculpture of mesoscutum and disc of scutellum hardly different from that of *opacus*, less dull than in both *cavifrons* and *crius*. Propodeum with the complete, strongly developed areolation typical of the species grouped around *opacus*. Hind coxa smooth, unsculptured.

Ovipositor sheath about two thirds as long as the hind tibia.

PHILIPPINES : Ilong, Mt. Halcon, 4,500 ft., Mdro. Or., 11.v.1954, 2 ♀♀, one the *TYPE*, 6.v.1954, 1 ♀, (*M. & D. Townes*).

Type in Coll. Townes.

A most distinct species on colour alone.

Apanteles crius sp. n.

♀. In spite of its very short ovipositor and enlarged apical tarsal segment on front and middle legs (Text-fig. 12), this species is closely related to the *opacus* group of species.

The very shiny, smooth-looking hind coxa is yellow beneath on apical half ; the hind femur is infusate except for a yellow base as in *opacus*.

Head from above deeper than in *opacus* and exactly as in *cavifrons*. Eyes slightly more convergent below than in either *opacus* or *cavifrons* but the face shiny and smooth-looking as in *cavifrons*.

Tergite 1 exactly as in *niceppe* (cf. Text-fig. 28).

PHILIPPINES : Luzon, Mt. Makiling, 1 ♀, the *TYPE*, (*Baker*).

Type in U.S. National Museum.

An aberrant but most distinct species on the characters given in the key.

Apanteles anodaphus sp. n.

♂♀. Legs predominantly dark ; hind femur blackish ; hind basitarsus whitish yellow at base. Gaster yellow at base beneath.

♀. Face shiny but coarsely and indistinctly punctate. Vertex between the ocelli and the eye-margin shiny but distinctly punctate. Flagellum somewhat bristly, weakly tapered to apex, decidedly long and with the preapical segment about one and a half times longer than wide.

Mesoscutum strongly shining, strongly punctate ; punctures almost confluent along the course of the notaulices but more or less discrete behind and here surface without trace of striation. Scutellum strongly shining and with traces of punctation along sides. Areolation of propodeum strong, as in *opacus* and close allies. Anterior half of mesopleurum very shiny, coarsely, confluent punctate. Abscissa 1 of the radius about three times as long as the transverse cubitus ; hind wing rather narrow.

Tergite 1 about two and a half times longer than wide, parallel-sided, its horizontal surface striate-rugose and with narrow, medial channel that, in front, narrows to a very strongly raised keel. Enclosed area of tergite 2 about three times as wide apically as long ; its basal width twice as long as a lateral sulcus.

♂. Like female except that enclosed area of tergite 2 is a little less transverse.

N. GUINEA : Papua, Kokodana, 1200 ft., iv.1933, 1 ♀, the *TYPE*, viii, 1 ♂, ix, 4 ♂♂, (*L. E. Cheesman*).

Type in the British Museum (Nat. Hist.).

Clearly allied to *opacus* and its relatives, this species is distinct on account of its dark wings and shiny, heavily punctate mesoscutum.

Apanteles cypris sp. n.

♀. Differs essentially from *opacus* in having tergite 1 shorter, wider and not or hardly narrowed behind ; the median field of tergite (2 + 3) is, in consequence, more transverse (Text-fig. 39).

Disc of scutellum distinctly punctate but the punctures more obvious on anterior half.

Tergite 1 with a distinct longitudinal channel, margined along each side. Ovipositor sheath about three quarters as long as the hind tibia.

PHILIPPINES : Manila, 11 ♀♀, one the *TYPE*, (*R. Brown*) ; Luzon, Mt. Makiling, 4 ♀♀ ; Los Baños, 2 ♀♀ ; Mt. Banahao, 1 ♀, (*All Baker*). MALAYA : Singapore, 2 ♀♀, (*Baker*).

Type in the U.S. National Museum.

Characterized by the shape of the first tergite and the strongly curved ovipositor (cf. following species).

Apanteles cyprioides sp. n.

♀. Extremely close to *cypris* and perhaps not really distinct from it. It differs chiefly from *cypris* in the shape of the first tergite and in this one respect is less close to *opacus* than is *cypris*.

Disc of scutellum smooth, polished with no trace of punctation. Surface of mesoscutum decidedly more shiny.

Tergite 1 shorter than in *cypris* and slightly more quadrate, its surface smooth and with hardly a trace of a longitudinal channel. The ovipositor is strongly curved just as in *cypris*.

PHILIPPINES : Los Baños, 3 ♀♀, one the *TYPE*, (*Baker*) ; Luzon, Mt. Makiling, 2 ♀♀ ; Manila, 2 ♀♀ ; Mindanao, Iligan, 1 ♀. MALAYA : Singapore, 5 ♀♀, (*All Baker*). S. AFRICA : Port St. John, Pondoland, 5-30.iv.1925, 1 ♀, (*R. E. Turner*).

Type in U.S. National Museum.

I can find no difference between the single female from S. Africa and the oriental series that would justify specific separation. In the African specimen, however, tergite 1 is slightly shorter and slightly more widened apically. The ovipositor shows the same characteristic curvature as occurs in the oriental forms.

Apanteles diocles sp. n.

♀. Hind tibia paler yellow than the hind femur, infuscate at extreme apex.

Head above shiny, polished ; only very faint rugosity at temples. Face shiny, with satin-like sheen. Eyes virtually not convergent. Antenna as long as the body with segment 17 about two and a half times longer than wide.

Mesoscutum closely punctate and shiny between the punctures ; the general surface of the mesoscutum appears shiny rather than dull. Disc of the scutellum almost smooth and with feeble punctation along sides. Areolation of propodeum sharp and well developed ; the three posterior areas highly polished and almost smooth. Hind coxa smooth except for traces of punctation along upper edge. Setae of the fore wing faintly brownish ; metacarp fully six times as long as its distance from the apex of the radial cell.

Tergite 1 distinctly narrowed behind. Median field of tergite (2 + 3) smooth, shining, slightly longer in proportion to the rest of the tergite than in *opacus* and its close allies (Text-fig. 75), angled laterally at about 45 degrees.

INDIA : United Provinces, Dehra Dun, 31.vii.1934, 1 ♀, the *TYPE*, ex *Sylepta lunalis*, (*S. N. Chatterjee*). SUMATRA : Fort de Kock, 920 m., 1925, 1 ♀, (*Jacobson*).

PHILIPPINES : Los Baños, 2 ♀♀, (*Baker*).

Type in British Museum (Nat. Hist.).

Host : *Sylepta lunalis* Guenée. (Pyraustidae).

The specimen from Sumatra has the hind coxa yellowish towards apical third and the hind femur darkened above towards apex and the hind tibia more extensively blackened at tip than in typical examples.

This species is essentially characterized by the shortness of the apical segment of the hind leg in relation to segment 4.

Apanteles salutifer Wilkinson

Apanteles salutifer Wilkinson, 1931a : 77.

♀. Hind tibia yellow almost throughout, with hardly a trace of apical infuscation ; hind tarsal segment 1 yellowish on fully basal half.

Face somewhat wide, very distinctly punctate, especially towards the antennal sockets. Eyes hardly convergent. Occiput and temples quite strongly rugose though the sculpture almost fades out between the posterior ocellus and the eye-margin. Antenna as long as the body.

Mesoscutum on each side of the middle line, strongly shining between its rather large, sharp punctures ; a large area at the posterior end of the notaulic course striate-punctate. Disc of scutellum highly shining and with traces of large, but very ill defined punctures that towards sides become mixed with longitudinal rugosity. Sculpture of mesopleurum consisting of punctuation rather than simple rugosity. Costula of propodeum usually broken and ill defined. Metacarp a little shorter in proportion to its distance from the apex of the radial cell than in *diocles*.

Tergite 1 and (2 + 3) (Text-fig. 74) ; horizontal part of tergite 1 with fairly distinct, polished, medial trough.

SIAM. BURMA. CHINA.

Type in British Museum (Nat. Hist.).

The series from China has the hind wing very slightly less wide than the two series from Siam and Burma and the ovipositor slightly shorter. In spite of these differences I think that only one species is present.

A. salutifer is largely characterized by the colour of its hind femora, combined with the shape of tergite 1 and the long ovipositor.

Apanteles dores sp. n.

♀. Related to both *diocles* and *salutifer* and in many respects intermediate between those two species.

Hind tibia, like the hind femur, reddish yellow, but tipped with infuscation ; slightly more than basal half of hind tarsus 1, reddish yellow. Scape reddish yellow except for darkened apical rim.

Head above more rugose than in *salutifer* and much more rugose than in *diocles*. Width of face and its punctuation as in *salutifer*.

Surface of mesoscutum dull by comparison with that of *diocles* and *salutifer* ; punctuation similar to that of *salutifer* with dull interspaces. Disc of scutellum with stronger punctuation than in *salutifer* and more conically narrowed behind. Mesopleurum coarsely rugose with punctures clearly in evidence only at extreme posterior limit of sculptured zone. Propodeum distinctly longer than in *diocles*, hardly longer than in *salutifer* ; costula weak but distinct ; three posterior areas highly polished. Metacarp very long, fully six times as long as its distance from the apex of the radial cell.

Tergite 1 with large, smooth areas and polished medial trough. Median field of tergite (2 + 3) as in *diocles*.

BORNEO : Sandakan, 1 ♀, the *TYPE*, (*Baker*).

Type in U.S. National Museum.

This species is largely characterized by the dullness of the mesoscutal sculpture.

Apanteles florus sp. n.

♀. Hind femur yellowish brown ; hind tibia still paler with faint apical infuscation.

Frons and vertex with coarse, glistening rugosity ; sculpture of temples finer but without trace of punctuation. Face strongly shining, smooth. Eyes not at all convergent. Antenna as long as the body ; more apical segments rather loosely articulated, the preapical segment fully one and a half times longer than wide ; flagellum somewhat bristly.

Propodeum rather long (Text-fig. 52) ; its areolation on the whole sharp, distinct, the three fields strongly shining and smooth-looking. Anterior part of mesopleurum with coarse rugosity. Median cell with long, sparse setae ; stigma pale medially but not strikingly pellucid ; hind wing rather broad.

Tergite 1 hardly narrowed behind, its horizontal part with broad, ill defined, almost smooth trough ; elsewhere with vague, coarse, shiny striation. Ovipositor sheath very slightly shorter than the hind tibia ; ovipositor rather thick (Text-fig. 50).

Length: 2.5 mm. without ovipositor.

CHINA : Canton, 15 ♀♀, one the *TYPE*, 2 ♂♂, (*W. E. Hoffman*).

Type in British Museum (Nat. Hist.).

Characterized essentially by the coarse sculpture of the top of the head and of the mesoscutum. In all other respects the species is extremely like *salutifer* to which it is naturally related.

Apanteles abdera sp. n.

♀. Hind coxa and hind femur entirely dark ; hind tibia darkened on rather more than apical half ; hind tarsus infusate throughout ; hind trochanter yellow.

Head rather deep from back to front ; temples with only very feeble rugosity ; vertex between the posterior ocellus and eye-margin smooth except for satin-like sheen. Face smooth, shining, with hardly a trace of punctation. Antenna as long as the body ; segment 17 about one and one third times longer than wide ; flagellum slightly thickened towards apex.

Mesoscutum densely punctate ; the punctures, on the whole, large and sharply defined, with the usual crowding along the course of the notaulices ; at posterior end of nataulic course, the surface is rather finely striate-punctate. Disc of scutellum smooth, shining, virtually unsculptured. Areolation of propodeum strong, complete. Hind coxa markedly rugose on outer face. Metacarp hardly more than four times as long as its distance from the apex of the radial cell ; hind wing narrow.

Ovipositor sheath slightly shorter than the hind tibia ; seen from above, its hairs long and upstanding.

Length: ca. 2.6 mm. without ovipositor.

AFRICA : Cape Province, Mossel Bay, ix.1924, *TYPE* ♀, (*R. E. Turner*), 52 other females from Mossel Bay. Three females (Natal, Transkei, Umtata ; Pondoland, Port St. John) agree with the Mossel Bay material except that the median field of tergite (2 + 3) is slightly less transverse in the Port St. John specimens.

Type in the British Museum (Nat. Hist.).

Apanteles metellus sp. n.

♀. Closely related to *abdera* and like that species having outer side of hind coxa considerably rugose. May be compared with *abdera* as follows:—

Eyes markedly convergent (Text-fig. 24).

Apart from having the legs much more brightly coloured, the antennal scape is also in greater part yellowish.

Mesoscutum duller, its punctation finer, especially on each side of the middle line. Disc of scutellum with distinct traces of punctation, especially along sides. Wings glassy clear ; abscissa 1 of the radius less obliquely placed on the stigma and slightly longer in proportion to the length of the first transverse cubitus.

Hairy part of ovipositor sheath hardly more than two thirds as long as the hind tibia.

S. AFRICA : Cape Province, Mossel Bay, vi.1921, *TYPE* ♀, (R. E. Turner) ; Somerset East (2 out of 3 examples have the hind coxa almost entirely yellow) ; Natal, Van Reenen and Weenen ; Orange Free State, Harrismith ; Basutoland, Mamathes. (Thirty-three examples from the above localities but most from Mossel Bay). Tanganyika ; Mt. Meru, 6,500 ft., 1 ♀, Ngong, 1 ♀.

Type in the British Museum (Nat. Hist.).

A single female (S. W. Africa, Okahandja) has the hind femur darkened on apical two thirds. One female out of four from Port St. John has the apical infuscation of the hind femur extending as a dark flush over nearly apical half but more weakly below.

Apanteles menes sp. n.

♀. Another species with eyes as convergent below as in *metellus*. The two species are strikingly alike.

The face is very slightly roughened whereas in *metellus* it is completely smooth.

Abscissa 1 of the radius is slightly shorter in proportion to the length of the 1st transverse cubitus than in *metellus* and the junction of these two veins is more distinctly angled ; in this respect, *menes* is more like *abdera* than *metellus*.

S. AFRICA : Pondoland, Port St. John, 5-30.iv.1923, 1 ♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

Apanteles agrus sp. n.

♀. Another species with convergent eyes. These are more convergent than in *metellus* but the face is equally smooth.

The appearance of the mesoscutum and scutellar disc is virtually indistinguishable from that of *metellus*. Rugosity of mesopleurum changing to fine striation posteriorly ; this change is hardly indicated in *metellus*. Metacarp very long, almost closing the radial cell.

S. AFRICA : Cape Province, Mossel Bay, xii.1921, 1 ♀, (R.E. Turner) ; Pondoland ; Port St. John, v.1924, 1 ♀, the *TYPE*, (R.E.T.).

Type in the British Museum (Nat. Hist.).

The essential characters of this species are the short, thick, strongly curved ovipositor and the very short ovipositor sheath.

Apanteles agatillus sp. n.

♀. Very closely related to *metellus* and its close allies. Apart from having the hind coxa entirely yellow and smooth, it differs from *metellus* as follows:—

Scape entirely dark. Apart from the median field, the whole of tergite (2 + 3) is bright yellow in the type.

Eyes very slightly less convergent and the face distinctly roughened.

Scutellar disc smooth, polished. Metacarp a little longer. Tergite 1 narrower and less coarsely sculptured. Median field of tergite (2 + 3) shiny, almost polished. Ovipositor sheath slightly longer.

S. AFRICA : Pondoland, Port St. John, 5-30.iv.1923, 2 ♀♀, one the *TYPE*, (R.E. Turner).

Type in the British Museum (Nat. Hist.).

Apanteles meriones sp. n.

♀. Another species closely related to *metellus* and its allies and because of its entirely yellow, smooth, hind coxa closest to *agatillus*.

Scape yellow except for darker apical rim.

Eyes as convergent below as in *metellus* and *agatillus* but face smooth. Antenna broken but segment 15 about one and half times longer than wide ; flagellum with somewhat bristly pubescence, as in *agatillus* ; in *metellus*, this pubescence is closer, more adpressed.

Disc of scutellum smooth, polished, somewhat convex, as in *agatillus*. Propodeum with numerous strong rugae but the costula virtually not defined. Metacarp slightly longer than in *metellus*.

Tergite 1 and median field of tergite (2 + 3), (Text-fig. 36). Ovipositor sheath about three quarters as long as the hind tibia, that is, longer than in both *metellus* and *agatillus*.

S. AFRICA : Natal ; Kloof, 1,500 ft., viii.1926, 1 ♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

Apanteles acoris sp. n.

♀. Scale pale to yellowish.

Eyes convergent as in *metellus*. Face distinctly roughened. Antenna as long as the body with the pubescence of the flagellum rather long, and somewhat bristly ; the flagellum is slightly thicker than in *metellus*.

Disc of scutellum more convex than in *metellus* ; strongly shining and more or less smooth ; exactly as in *agatillus* and *meriones*. Propodeum with strong, very well defined areolation.

Tergite 1 not so densely rugose as in *metellus* but with a fairly well defined, broad, shallow furrow on its horizontal part.

S. AFRICA : Cape Province, Katberg, 4,000 ft., xii.1932, 2 ♀♀, one the *TYPE*, x.1932, 1 ♀, (R. E. Turner).

Type in British Museum (Nat. Hist.).

On account of the entirely yellow hind coxa this species could be confused only with *meriones* and *agatillus*. Of these two it more closely resembles *agatillus* and indeed may not really be distinct from that species. The only difference of value seems to be the more transverse median field of *acoris* and its slightly longer ovipositor sheath.

Apanteles arsanes sp. n.

♀. A species chiefly characterized by the very short ovipositor sheath.

Scape black. Hind tibia becoming gradually infusate on about apical third on outer side but more abruptly darkened on inner side.

Eyes as convergent as in *metellus* (cf. Text-fig. 24). Face faintly roughened. Head more transverse than in *metellus* and its close allies but the space between the posterior ocelli and the eye-margin equally smooth and shiny. Antenna as long as the body with the preapical segment about one and half times longer than wide.

Mesoscutum rather dull and altogether with finer sculpture than in *metellus*. Disc of scutellum somewhat dull and superficially punctate-rugose. The blackened hind coxa is markedly roughened on outer side ; hind spurs strong, with the inner one almost twice as long as the outer one.

Tergite 1 hardly narrowed behind. Median field of tergite (2 + 3) about four times as wide as long.

Length: ca. 2.8 mm. without ovipositor.

AFRICA : Kenya, Kiambu, 2 ♀♀, one the TYPE, 2 ♂♂, bred 20.xii.1930, from *Odites artigena* (R. H. Le Pelley) ; Ruiri, Komassie Est., 3 ♀♀, 4 ♂♂, v.1957, (D. I. McCrae).

Type in British Museum (Nat. Hist.).

Host : *Odites artigena* Meyrick (Xylorictidae).

Apanteles nycon sp. n.

♀. Legs on the whole dark ; hind coxa, hind and middle femur, deeply infusate ; hind tibia becoming dull reddish yellow on basal half.

Eyes very strongly convergent below, more so than in *metellus* (cf. Text-fig. 24). Face somewhat dull, with superficial punctation. Antenna almost as long as the body, rather thin and with the preapical segment about one and one third times longer than wide. Frons and vertex between the posterior ocellus and the eye-margin almost polished.

Mesoscutum dull, coarsely punctate-rugose. Middle field of side of pronotum dull, scaly-reticulate. Posterior part of mesopleurum almost everywhere with very fine aciculation. Metacarp rather short, about three and a half times as long as its distance from the apex of the radial cell.

Tergite 1 slightly widened behind, coarsely, densely rugose. Median field of tergite (2 + 3) about three times as wide as long. Ovipositor sheath almost as long as the hind tibia.

Length: 3 mm. without ovipositor.

S. AFRICA : Cape Province, George, 15—17.xi.1921, 1 ♀, the TYPE, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

A very distinctive species, characterized by the heavily punctate disc of the scutellum combined with the obliquely placed first abscissa of the radius. Closest to *antilla* from which it differs in having convergent eyes.

Apanteles inaron sp. n.

♀. Having convergent eyes, this species may be compared with *nycon*, from which it differs as follows:—

Legs darker, the whole of the hind leg deeply infusate except that the hind tibia is pale at extreme base.

Frons and vertex dull, finely rugose, the space between the posterior ocellus and the eye-margin not at all shining. Face smooth. Eyes slightly less convergent and not impressed on each side of clypeus at lowest point of eye (rather a feature of *nycon*). Antenna slightly thinner with the preapical segment about one and a half times longer than wide.

Mesoscutum more finely, densely sculptured, the notaulic bands so much widened, that on posterior half of mesoscutum they unite to form a very large, characteristically dull area. Propodeum densely rugose but the areolation tending to lack definition and the costula

sometimes hardly indicated. Metacarp longer than in *nycon*.

Ovipositor sheath as long as the hind tibia.

S. AFRICA : Cape Province, Somerset East, 1-26.i.1921, 1 ♀, the *TYPE*, x & xi. 1930, 2 ♀♀ ; Pondoland, Port St. John, x & xii, 2 ♀♀, (all R. E. Turner).

Type in British Museum (Nat. Hist.).

Apanteles antilla sp. n.

♀. Closely resembles *nycon* in the sculpture of the mesoscutum and of the disc of the scutellum. It differs from *nycon* in not having convergent eyes and may be further compared with that species as follows:—

As in *nycon*, the frons and that part of the vertex between the posterior ocellus and the eye-margin are smooth, shining. Ocelli smaller and in a higher triangle, the posterior transverse tangent to the anterior ocellus passing clearly in front of the posterior ocelli. Although the antenna is broken, the fourteen existing segments indicate clearly that it is longer and thinner than in *nycon*.

Disc of scutellum closely punctate-reticulate. Both fore and hind wing narrower, decidedly brownish, median cell of fore wing densely setose ; 1st abscissa of the radius hardly longer than the transverse cubitus, the two veins strongly angled at their junction ; metacarp slightly longer than in *nycon*, the radial cell itself being longer and more narrow.

Tergite 1 dull, densely rugose all over, without indication of a longitudinal depression on its horizontal part.

S. AFRICA : Cape Province, Swellendam, xi. 1 ♀, the *TYPE*, (R. E. Turner).

Type in British Museum (Nat. Hist.).

This species has the hind leg long and thin ; the hind tarsus appears particularly thin, partly because, in profile, the keel beneath the segments is hardly visible.

Apanteles anatole sp. n.

♀. A species with short first abscissa of radius and because of this, together with the dull, strongly rugose mesoscutum in whose sculpture no longitudinal elements occur at posterior end of notaulic course, probably more closely related to *nycon*, *inaron* and *antilla* than to the species clustering around *metellus*. It differs from the first three mentioned species in having a much longer ovipositor.

Hind femur in greater part yellow, with infuscation at apex above (Somerset East) or infuscate all over upper surface (Milnerton).

Eyes hardly convergent below (Text-fig. 23). Face with superficial punctation. Frons and vertex faintly dull ; space between posterior ocellus and eye-margin faintly roughened and with a satin-like sheen. Antenna about as long as the body with the preapical segment fully one and one third times longer than wide.

Mesoscutum dull, densely rugose-punctate ; notaulic courses broadening behind to form two large, still duller patches that virtually unite. Propodeum thickly covered with rugae but the costula not defined. Hind coxa extremely finely roughened on outer side with a satin-like sheen ; above with close rugose-punctation. Wings hyaline ; vannal lobe not in the least concave beyond its widest part and here with an occasional projecting hair.

Tergite 1 rather short and broad, much more like that of *inaron* than that of *nycon* and *antilla* (Text-fig. 33) ; its horizontal part with an ill defined longitudinal furrow.

S. AFRICA : Cape Province, Somerset East, x.1930, 4 ♀♀, one the *TYPE*, (R. E. Turner) ; Milnerton, 14-28.xii.1925, 2 ♀♀, (R.E.T.).

Type in the British Museum (Nat. Hist.).

On shape of basal tergites and absence of complete propodeal areolation most closely related to *inaron* but differing strikingly from that species by having non-convergent eyes. In *inaron*, the vannal lobe beyond its widest part is almost as straight as in *anatole* but the wing edge here never shows the occasional projecting hair as does *anatole*. This difference should be accepted with caution. The rugose sternaulus is an important secondary character for recognising *anatole*.

Apanteles racilla sp. n.

♀. Hind femur bright reddish yellow with the faintest touch of infuscation at apex above ; hind tibia reddish yellow but tipped with infuscation.

Eyes not noticeably convergent below. Face with superficial but fairly distinct punctation. Frons with some fine rugosity (fine aciculation encircling scrobes) ; space between posterior ocellus and eye-margin almost smooth.

Sculpture of mesoscutum much as in *anatole* but more clearly punctate with faint indication of longitudinal elements at posterior end of notaulic course. Disc of scutellum flat, weakly punctate but the punctures closer towards sides. Propodeum densely covered with rugae but the costula not clearly defined. Wings glass-clear ; setae of median and submedian cells sparse, colourless and widely absent along medius side of cells. Hind coxa dull with satin-like sheen and fine punctures along upper edge.

Tergite 1 large, subquadrate (Text-fig. 29). Median field of tergite (2 + 3) very strongly transverse and only about one quarter as long as the rest of the tergite beyond it.

S. AFRICA : Cape Province, Matjesfontein, 14-27.xi.1928, 1 ♀, the TYPE, 1-18. xii.1928, 1 ♀, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

Largely characterized by the shape of the median field of tergite (2 + 3) ; this field is more transverse than in any other African species known to me. Among the oriental species, both *cypris* and *cyprioides* have the basal tergites showing an approach to the shape occurring in *racilla* but both these species have a distinctly concave vannal lobe, complete propodeal areolation and much shorter ovipositor. Their relationship with *racilla* is probably not very close.

Apanteles rutilans sp. n.

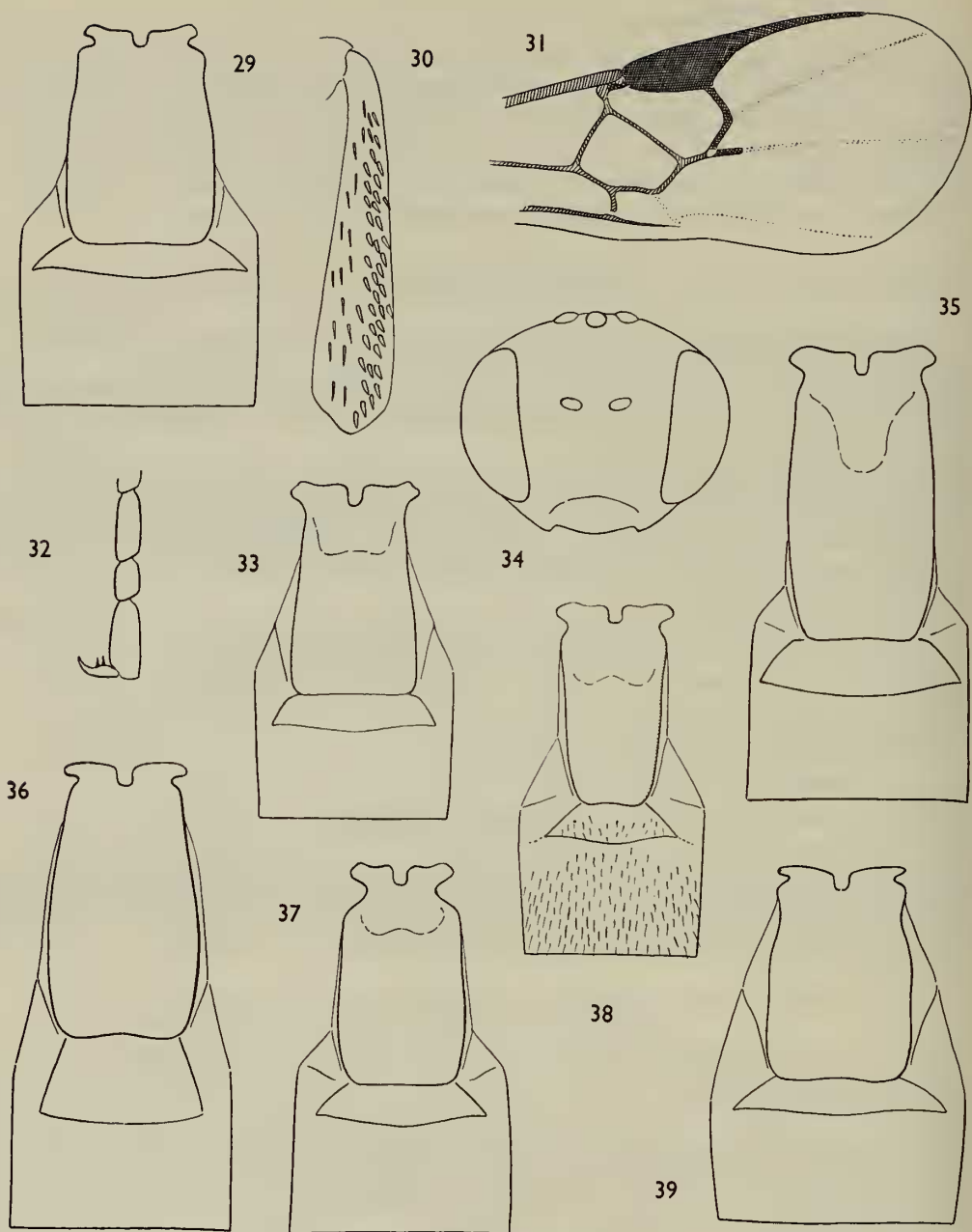
♀. Here is a species with legs coloured as in *racilla* except that the hind tibia is rather more extensively infuscated at tip.

Eyes not convergent. Face dull, conspicuously punctate, almost rugose-punctate. The thimble-punctation of the vertex and temples is very strong and in sharp contrast with the semi-circular dorsal intrusion of the faintly dull, but smooth occiput. The antennal scrobes are sharply separated from the dull, punctate frons by being abruptly deeper and filled with shiny, concentric aciculation.

Disc of scutellum faintly dull and indistinctly punctate, the punctures larger towards front and sides. Mesopleurum with distinct, rugose sternaulus. Hind coxa dull, with satin-like sheen ; its outer, upper face densely punctate. Setae of the fore wing darkened.

Tergite 1 and (2 + 3), (Text-fig. 37).

E. AFRICA : Naivasha, vii.1936, 1 ♀, the TYPE, (H. J. A. Turner).



FIGS. 29-39. *Apanteles*, ♀: 29, *racilla* sp. n., basal tergites; 30, *cocotis* Wilkinson, hind tibia; 31, *argiope* sp. n., fore wing; 32, *phycodis* Viereck, apical three segments of hind tarsus; 33, *anatole* sp. n., basal tergites; 34, *stenotelas* sp. n., head, from in front; 35, *isander* sp. n., basal tergites; 36, *meriones* sp. n., same; 37, *rutilans* sp. n., same; 38, *argiope* sp. n., same; 39, *cypris* sp. n., same.

Type in British Museum (Nat. Hist.).

Different from all the other African species on sculpture of head alone and not closely related to any of the oriental species.

Apanteles mycerinus sp. n.

♀. Legs, on the whole, rather bright yellow, but the hind coxa, hind femur and apical half of hind tibia deeply infusate.

Eyes virtually not convergent. Face smooth and more or less polished. Vertex between the posterior ocellus and the eye-margin smooth, with faint satin-like sheen. Temples with only faint rugosity. Antenna slightly shorter than the body; segment 17 about one and one third times longer than wide.

Sculpture of mesoscutum predominantly one of punctation with indication of longitudinal elements at posterior end of notaulic course; surface moderately shiny but general sculpture not at all characteristic. Sternaulus wanting. Outer side of hind tibia with band of thick, close spines along upper edge. Wings faintly brownish; 1st abscissa of the radius and the transverse cubitus hardly angled at their junction.

Tergite 1 posteriorly with a sculpture of rather weak striate-punctation.

S. AFRICA: Pondoland, Port St. John, 5-30.iv.1923, 2 ♀♀, one the *TYPE*, xi.1923, 1 ♀, (*R. E. Turner*).

Type in the British Museum (Nat. Hist.).

This species could be confused only with the following species, *novatus* sp.n.

Apanteles novatus sp. n.

♀. Closely related to *mycerinus* with which it may be compared as follows:—

Antenna as long as the body, thicker, but with the preapical segment relatively shorter, nearer to one and one quarter times longer than wide.

Mesoscutum with slightly less close punctation and the surface between the punctures considerably more shiny; between the notaulic courses, behind, there is a narrow, polished, wedge-shaped area, absent in *mycerinus*. Sculpture of anterior part of mesopleurum becoming simple, discrete punctation posteriorly. Sternum smooth, polished; in *mycerinus* it is faintly dull. Wings slightly darker; abscissa 1 of the radius more obliquely placed on the stigma (Text-fig. 25); 1st abscissa of radius and the transverse cubitus more distinctly angled at their junction; metacarp very slightly longer.

S. AFRICA: Pondoland, Port St. John, 16-28.iv.1924, 2 ♀♀, one the *TYPE*, ix.1923, 1 ♀, (*R. E. Turner*).

Type in the British Museum (Nat. Hist.).

Apanteles sosis sp. n.

♀. On the shape of the basal tergites, related to *novatus* and *mycerinus* but differing from both these species in having the eyes distinctly convergent below, the disc of the scutellum heavily punctate-rugose and the hind femur blackish throughout.

Frons and vertex markedly roughened but shiny; scrobes with fine concentric aciculation. Antenna as long as the body and like that of *novatus*.

Mesoscutum somewhat dull, closely punctate-rugose and without longitudinal elements at posterior end of notaulic course. First abscissa of radius placed at right angles to stigma and

slightly longer in proportion to the length of the transverse cubitus than in *mycerinus* and *novatus*.

The median field of tergite (2 + 3) is less transverse than in either of the above two species and is not more than twice as long as wide. The shape and general appearance of tergite 1 is exactly like that of *mycerinus*.

S. AFRICA : Pondoland, Port St. John, 1-9.vii.1923, 1 ♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

Apanteles hemara sp. n.

♀. A species characterized essentially by its strongly sculptured hind coxa and the densely rugose sculpture of the mesoscutum and of the disc of the scutellum.

The pale parts of the legs are, on the whole, bright yellowish.

Face distinctly roughened. The median field of tergite (2 + 3) is as rugose as tergite 1 (Text-fig. 47). Ovipositor sheath a little longer than the hind tibia.

INDIA : United Provinces, Dehra Dun, 3-6.vii.1928, 4 ♀♀, one the *TYPE*, 1 ♂ ex *Hymenia facialis* (S. N. Chatterjee) : Dehra Dun, series from *Pachyzancla stultalis*. AFRICA : Senegal, ex lepidopterous larva on *Coleus nardus* ; Pondoland, Port St. John ; Natal, Weenen ; Mauritius. AUSTRALIA : F.C.T., Molonglor. EUROPE : Italy.

Type in the British Museum (Nat. Hist.).

Host : *Hymenia facialis* Stoll (*recurvalis* F. =) (Pyralidae). *Pachyzancla stultalis* Walker (Pyralidae).

Having such a wide distribution, this species must surely have been already described. I have, however, been unable to find an existing name for it.

Apanteles faustina sp. n.

♀. Hind femur entirely infusate ; hind tibia becoming infusate after middle, passing from yellow at base through reddish yellow to deep infuscation.

Eyes hardly convergent below. Face smooth, with faint satin-like sheen. Vertex between the posterior ocellus and the eye-margin almost polished. Antenna a little shorter than the body, thin, with the preapical segment about one and one third times longer than wide.

Mesoscutum and disc of scutellum slightly less densely sculptured and hence a little less dull than in *hemara*. The posterior part of the mesopleurum is finely, rather vaguely aciculate. Hind wing considerably broader than in *hemara*.

Shape and sculpture of basal tergites as in *hemara* (cf. Text-fig. 47). Ovipositor sheath about one and a quarter times longer than the hind tibia.

MAURITIUS : Réduit, 9.iv.1945, 1 ♀, the *TYPE*, 12.vi.1945, 1 ♀, both bred from *Nacoleia praeteritalis*.

Type in the British Museum (Nat. Hist.).

Host : *Nacoleia praeteritalis* Walker (Pyraustidae).

Clearly belongs to the *metellus* complex of species and needs to be carefully distinguished from *syleptae* Ferrière.

Apanteles syleptae Ferrière

Apanteles syleptae Ferrière, 1925, in Vayssière & Mimeur : 261.

Apanteles syleptae Ferrière ; Wilkinson, 1932 : 318.

♀. This is a species with glass-clear wings and the venation proximal to the areolet colourless with the setae of the median cell equally colourless. Having a rather broad hind wing it comes close to *faustina*, from which it differs chiefly in having a shorter ovipositor.

Face smooth, polished, with satin-like sheen, as in *faustina*.

Mesoscutum and disc of scutellum as in *faustina*. Hind coxa shiny but with rugosity and some striation on outer side but lacking the satin-like sheen of *faustina* (this difference may be of little value).

AFRICA : Tanganyika ; Kenya ; Gold Coast ; Nigeria.

Type in the British Museum (Nat. Hist.).

Host : *Sylepta derogata* Fab. (Pyraustidae).

Having a certain amount of fine striation at posterior end of the notaulic courses, this species is different from *hemara*, from which species it otherwise differs by the same characters as separate *faustina* from *hemara*.

Apanteles isander sp. n.

♀. A rather large, (ca. 3.3 mm. without ovipositor), dark-legged species with entirely blackish gaster.

Eyes not convergent below. Face smooth but dull owing to a rather intense, satin-like sheen. Vertex between the posterior ocellus and the eye-margin faintly dull and rugulose. Scrobes with fine concentric aciculation. The head is more transverse than in *metellus* and its close allies. Antenna rather short with the preapical segment hardly longer than wide.

Mesoscutum dull, densely, rather finely punctate. Notaulic course showing as a dull band that posteriorly widens but does not show longitudinal elements. Rugosity of mesopleurum changing to fine aciculation posteriorly ; this aciculation covers most of what is normally a polished surface. Propodeum with strongly delimited, almost polished areola but without distinct costula. Spines along upper part of outer side of hind tibia short and stubby and sharply differentiated from the finer spines adjacent to them.

Tergite 1 dull, finely, densely and on the whole very evenly rugose ; median field of tergite (2 + 3) strongly transverse (Text-fig. 35).

S. AFRICA : Cape Province, Mossel Bay, x.1921, 8 ♀♀, one the *TYPE*, (*R. E. Turner*), 7-14.xi.1921, 2 ♀♀, (*R.E.T.*).

Type in the British Museum (Nat. Hist.).

Apanteles raesus sp. n.

♀. A smaller, more delicately built species than *isander* from which it differs by little more than the characters given in the key.

Frons and vertex more finely sculptured, almost smooth and polished except for satin-like sheen. Scrobes with hardly a trace of aciculation. Antenna thinner ; characteristically thin with the preapical segment nearer to one and half times longer than wide.

Mesoscutum less dull, the punctate element of its sculpture much more in evidence. Propodeum with fewer raised rugae but the costula distinct. Wings narrower ; medial cell of the fore wing very densely and finely setose. Thicker spines on outer side of hind tibia sparser but longer and more pointed.

Tergite 1 relatively smaller, more finely sculptured and slightly more shiny.

Length: ca. 2.8 mm. without ovipositor.

S. AFRICA : Cape Province, Katberg, 19-26.ii.1933, 1 ♀, the *TYPE*, Matjesfontein, 7-13.xi.1928, 2 ♀♀ ; Mossel Bay, 15-iii-20.iv.1932, 1 ♀, (all *R. E. Turner*) ; Basutoland, Mamathes, 27.iv.1947, 1 ♀, (*C. Jacot-Guillarmod*).

Type in the British Museum (Nat. Hist.).

The hind spurs of this rather poorly characterized species are somewhat short, the inner one not reaching the middle of the basal tarsal segment. The pubescence of the flagellum is extremely short and gives the flagellum a faintly greyish appearance.

Apanteles parsodes sp. n.

♀. Front and middle femur pale brown ; hind femur darker.

Eyes not convergent. Face highly polished. Frons and vertex more or less smooth, faintly dull and with a satin-like sheen. Ocelli rather large ; a hind ocellus distant from the eye-margin by hardly twice its own diameter. Antenna about as long as the body, with segment 17 hardly longer than wide.

Mesoscutum showing the usual punctate sculpture but the surface decidedly shiny and the punctuation somewhat blurred. Disc of scutellum convex, smooth, polished, somewhat wide behind in comparison with the *metellus* complex of species and not at all truncate here ; suture between mesoscutum and disc of scutellum somewhat shallow and finely foveate. Hind coxa polished and virtually smooth. Metacarp about nine times as long as its distance from the apex of the radial cell, almost closing the radial cell ; edge of vannal lobe virtually straight. Spines along upper edge of hind tibia numerous, sharply pointed ; hind spurs rather short, the inner one not quite reaching middle of basal tarsal segment.

Tergite 1 fairly strongly narrowed from where it turns over to apex, dull and extremely finely, evenly rugose. Ovipositor sheath slightly longer than the hind tibia.

S. AFRICA : Cape Province, Mossel Bay, vi-vii.1930, 1 ♀, the *TYPE*, (*R. E. Turner*).

Type in the British Museum (Nat. Hist.).

Distinctive among African species on account of the high ocellar triangle. The obliquely placed first abscissa of the radius in combination with the long metacarp, shape and sculpture of tergite 1, probably largely characterize this species. It has little in common with the *metellus* complex of species, differing from it in not having the disc of the scutellum so strongly narrowed behind.

Apanteles chalcomelas sp. n.

♀. In spite of the scutellar disc which is wide and flattened behind, I regard this species as a typical member of the *metellus* complex though remarkably distinct on account of its short, tapering flagellum with its bristly pubescence in combination with the weakly transverse median field of tergite (2 + 3).

Hind tibia sharply yellow on rather more than basal half.

Head deep from back to front. Frons and vertex smooth, polished, except for faint satin-like sheen. Eyes not convergent.

Mesoscutum strongly shining, especially along middle on posterior half where the punctures tend to fade out ; very distinct striation at posterior end of notaulic course. Propodeum with

more or less complete areolation. Sculpture of anterior part of mesopleurum changing to clear punctation behind.

Ovipositor sheath about two thirds as long as the hind tibia.

S. AFRICA : Pondoland, Port St. John, 16-28.iv.1924, 1 ♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

On the shape of the basal tergites and appearance of the mesoscutum and disc of scutellum, this species is probably fairly closely related to *mycerinus* but there is no likelihood of confusing it with that species.

Apanteles adreus sp. n.

♀. Probably fairly closely related to *parsodes* but abundantly distinct from that species as well as from all others I include in this synopsis. May be compared with *parsodes* as follows:—

The legs have the same obscure yellowish brown appearance.

Frons and vertex smooth as in *parsodes* but lacking a satin-like sheen. Ocelli smaller, the distance between a posterior ocellus and the eye-margin being fully two and a half times longer than the diameter of the ocellus. Flagellum thick, its pubescence upstanding but dense and hardly bristly.

Disc of the scutellum decidedly flat, highly polished. Propodeum with very incomplete areolation; the areola itself defined only below; no trace of a costula. Anterior part of mesopleurum shiny and feebly rugose-punctate; sternaulus less sharply discrete, represented by a smooth, broad, oval furrow which above shows some rugose-striation. Venation less dark, the wings more glassy; stigma a little broader and the metacarp shorter, above five times as long as its distance from the apex of the radial cell; 1st abscissa of the radius placed almost at right angles to the stigma. Spines along upper edge of outer side of hind tibia finer, less conspicuous and virtually absent on posterior half.

Tergite 1 a little wider than in *parsodes*, its horizontal surface shorter but the sculpture essentially similar. Ovipositor sheath about one and one third times longer than the hind tibia, clothed with long upstanding hairs (Text-fig. 17).

S. AFRICA : Cape Province, Mossel Bay, vi.1921, 1 ♀, the *TYPE*, x.1921, 1 ♀, i.1922, 1 ♀, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

A most distinct species on account of the structure of the flagellum. Perhaps related to the Sumatran *aglaope* though abundantly distinct from that species. Not at all closely related to *chalconelas* in spite of having curiously short, thickened antennae like that species.

Apanteles aglaope sp. n.

♀. Legs brownish; hind tibia becoming dingy yellowish on basal half. Wings faintly brownish in addition to the sub-stigmal cloud.

Eyes large but not convergent; face hence rather small, much smaller than in *adreus*. Antenna hardly distinguishable from that of *adreus*. Ocelli in a low triangle, the transverse posterior tangent to the anterior ocellus touching or even slightly cutting the posterior pair.

Disc of scutellum somewhat convex, shiny, strongly narrowed behind and obscurely punctate towards sides. Posterior, polished part of mesopleurum without delimited sternaulus. Edge of vannal lobe distinctly concave.

Basal tergites and ovipositor (Text-figs. 64 and 67).

♂. The wings without a brown stain behind the stigma ; altogether paler but the stigma remains dark brown.

SUMATRA : Fort de Kock, iv.1921, 10 ♀♀, one the *TYPE*, 3 ♂♂, (*Jacobson*).

Type in the British Museum (Nat. Hist.).

Evidently a gregarious parasite, having emerged from white, papery cocoons, loosely heaped together.

This species is largely characterized by the short, thick ovipositor with its apical constriction.

Apanteles aper sp. n.

♀. A species with the ocelli in a high triangle and in general appearance not at all typical of the *ater*-group largely because the intricately rugose propodeum shows nothing of the areolate pattern normally present or at least indicated.

Hind tibia, like hind femur, rich yellow throughout.

Head rather large. Scrobes shiny and with aciculation. Face with a dense, conspicuous punctation. Space between a posterior ocellus and the eye-margin shiny and virtually smooth. Antennae broken but 14 segments present in one antenna ; flagellum thin with rather long, upstanding pubescence ; antennal segment 14 fully twice as long as wide.

Mesoscutum somewhat shiny, its punctation sharp, distinct ; a distinct striate-punctate area at posterior end of notaulic course. Disc of scutellum rather strongly narrowed behind ; polished but with a few large punctures towards sides. Median cell of the fore wing densely setose ; abscissa 1 of the radius rather obliquely placed on the stigma and not at all longer than the transverse cubitus ; metacarp about five times as long as its distance from the apex of the radial cell. Hind coxa smooth except for a small area of close punctation above at base.

Tergite 1 rather broad, shiny and rugose all over. Ovipositor sheath about three quarters as long as the hind tibia.

AUSTRALIA : S.E. Queensland, Tambourine Mts., 18-25.v.1935, 1 ♀, the *TYPE*, (*R. E. Turner*).

Type in the British Museum (Nat. Hist.).

Apanteles vala sp. n.

♀. Paler parts of the legs obscurely yellowish.

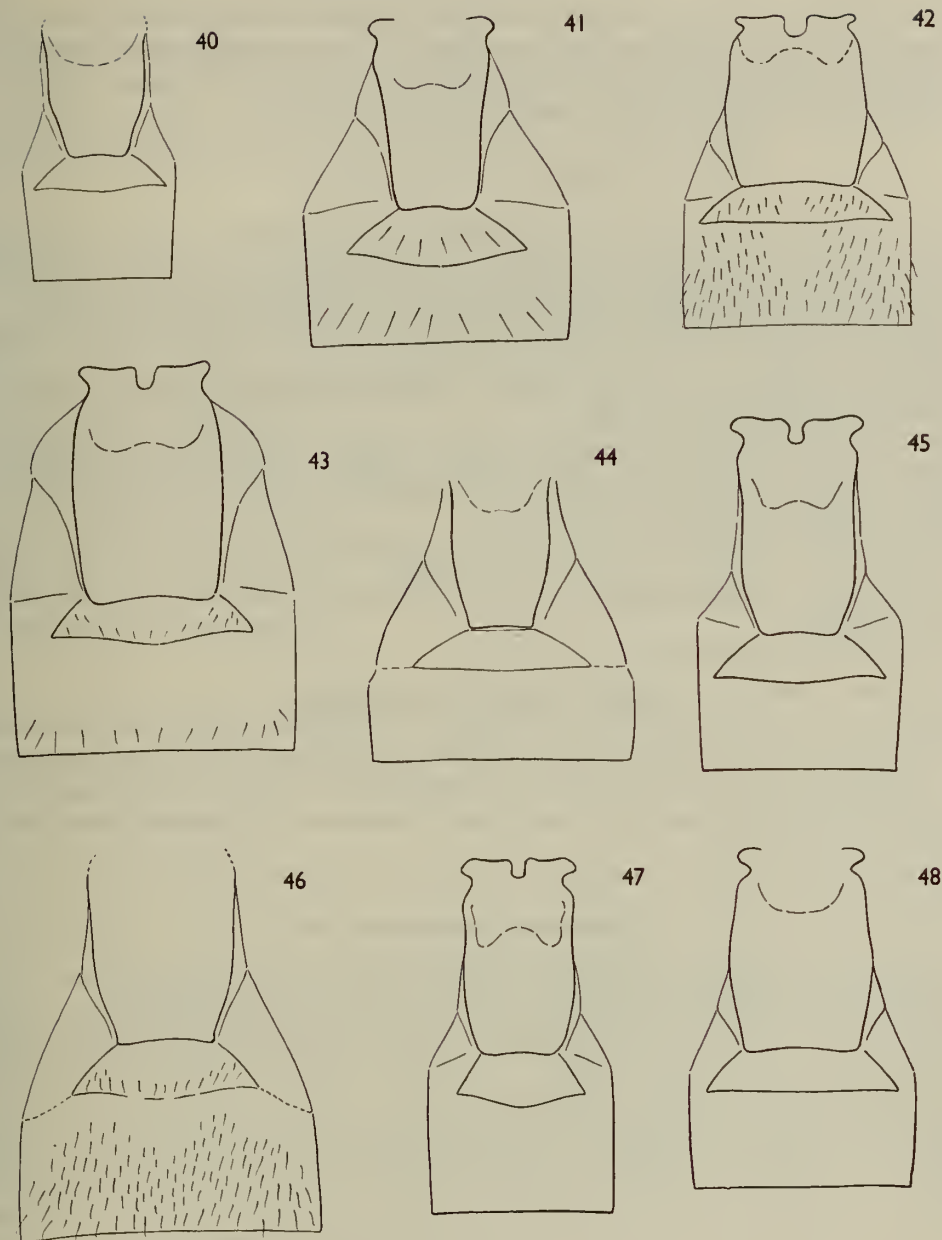
Eyes not convergent. Face smooth, shiny. Antenna slightly longer than the body ; flagellum thin with the preapical segment about one and a half times longer than wide.

Lateral lobe of mesoscutum on outer side of broad, densely rugose notaulic band showing, at least on posterior half of mesoscutum, as a polished strip with a few large, scattered punctures ; no conspicuous striate element at posterior end of notaulic course. Disc of scutellum highly polished, weakly convex and with a few, hardly noticeable punctures at each anterior corner. Three posterior surfaces of propodeum indicated by surface being highly polished and almost smooth. An area of fine striate-rugosity extends downwards obliquely into the smooth, posterior depression of the mesopleurum from the dorsal groove of the mesopleurum. Median cell of the fore wing with brown, rather sparse setae that tend to be widely absent along the medius side of the cell. Inner spur of the hind tibia rather long and distinctly reaching beyond the middle of the basal tarsal segment.

Tergite 1 and median field of tergite (2 + 3), (Text-fig. 41).

Length: ca. 2.7 mm. without ovipositor.

AUSTRALIA : S.E. Queensland, Tambourine Mts., 11-17.v.1935, 1 ♀, the *TYPE*, (*R. E. Turner*).



FIGS. 40-48. Basal tergites of *Apanteles*, ♀: 40, *sagax* Wilkinson; 41, *vala* sp. n.; 42, *psenes* sp. n.; 43, *pertiades* sp. n.; 44, *cocotis* Wilkinson; 45, *ater* (Ratzeburg); 46, *tirathabae* Wilkinson; 47, *hemara* sp. n.; 48, *oenone* sp. n.

Type in the British Museum (Nat. Hist.).

It is difficult to say what is characteristic about this species since I know of no other with which it could be readily confused. The narrow cubitellan cell of the hind wing is probably characteristic of a group of species but it certainly helps to distinguish *vala* from the species included in this synopsis.

Apanteles fundulus sp. n.

♀. Apart from the characters given in the key, this species differs at once from *vala* in the shape and sculpture of the 1st tergite; this is very weakly sculptured, almost smooth-looking and with a discrete oval trough on its horizontal part; and more narrowed behind than in *vala* (cf. Text-fig. 41); tergite 1 is almost coarsely rugose in *vala* and has no median trough.

Paler parts of the legs less obscurely yellowish; hind tibia with only very weak apical infuscation.

Eyes not convergent. Face highly polished. Preapical segment of the antenna about one and one third times longer than wide.

Lateral lobe of the mesoscutum showing a narrow, polished zone as in *vala*. Propodeum duller because of more raised rugosities; costula faintly indicated. Anterior part of mesopleurum strongly shining, and indistinctly punctate. Inner spur of the hind tibia shorter than in *vala*, hardly reaching middle of basal tarsal segment.

Length: 2 mm. without ovipositor, a smaller species than *vala*.

AUSTRALIA: S.E. Queensland, Tambourine Mts., 1-9.v.1935, 2 ♀♀, one the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

Both this species and *vala* are essentially characterized by the reduction of the gastral setae to a single row on the tergites. A similar reduction occurs in two other species known to me, namely *pertiades* (Solomons and Fiji) and *persephone* (W. Australia), both of which come in a different part of the key because of having the ocelli in a lower triangle. It is probable that these four species belong to the same species-complex.

Apanteles pertiades sp. n.

♀. A dark-legged species with highly polished gaster. Hind femur entirely dark brown; hind tibia dark brown but pallid on basal quarter; hind tarsus infusate throughout.

Eyes not convergent. Face strongly shining and with only indistinct, superficial punctation. Temples shiny and with superficial rugulosity. Antenna rather thick, slightly shorter than the body; segments 16-17 square in outline.

Mesoscutum strongly shining, its punctation sharp and, on the whole, discrete; almost no longitudinal elements mixed with the large punctures at posterior end of notaulic course. Scutellar disc highly polished, somewhat broad and flattened behind. Anterior part of mesopleurum very shiny, sharply, discretely punctate. Setae of the median cell long, sparse, widely absent along medius side of cell. Outer side of the hind coxa polished, smooth. Hind spurs rather short, the inner one hardly reaching middle of basal tarsal segment.

Tergite 1 shiny, coarsely rugose (Text-fig. 43). Ovipositor sheath as long as the hind tibia; seen from above, clothed with long, upstanding hairs (Text-fig. 62); ovipositor rather thick.

SOLOMONS: 7 ♀♀, one the *TYPE*, 2 ♂♂, ex *Tirathaba rufivena* (R. A. Lever).
N. GUINEA: Port Moresby, 1 ♀, 1 ♂, ex *Tirathaba rufivena* (T. H. C. Taylor).

Type in the British Museum (Nat. Hist.).

Host : *Tirathaba rufivena* Walker (Galleriidae).

Important for the recognition of this species is the sculpture of the mesopleurum. It is closely related to *persephone*. Also related to *pertiades* on most characters is *tirathabae*, a species which differs from *pertiades*, however, in having tergite 1 strongly narrowed behind and the setae of the gaster much more numerous.

Apanteles persephone sp. n.

♀. Apart from the differences given in the key, differs from *pertiades* as follows:—

Antenna thinner, slightly shorter in proportion to the length of the body. Sculpture of temples slightly stronger and the frons with a slightly clearer indication of weak punctation.

Punctures of mesoscutum unusually large but the interspaces shiny as in *pertiades*. Hind tibia becoming gradually infusate towards middle but the infuscation less intense than in *pertiades*; reddish rather than dark brown.

Ovipositor sheath very slightly longer; ovipositor thinner.

W. AUSTRALIA : Yanchep, 3–19.xii.1935, 1 ♀, the TYPE, (R. E. Turner); Don-
garra, 11–28.x.1935, 1 ♀, (R.E.T.).

Type in the British Museum (Nat. Hist.).

This species is essentially characterized by the unusually coarse punctation of mesoscutum and mesopleurum.

Apanteles tirathabae Wilkinson

Apanteles tirathabae Wilkinson, 1928b : 202.

♀. Closely related to *pertiades* and differing from it as follows:—

Legs paler, more reddish; hind femur brownish rather than blackish; hind tibia becoming infusate after about middle.

Mesoscutum more shiny, its punctation finer and tending to become finer, almost obsolescent on posterior half of middle lobe; posterior end of notaulic course with a small zone of striate-punctation. No clearly discrete line of sculpture extending downwards from the dorsal groove of the mesopleurum into the smooth, oblique depression. Areolation of propodeum stronger, the three posterior areas shiny and almost polished. Inner spur of the hind tibia slightly longer in relation to the outer one and reaching virtually the middle of the basal tarsal segment; spines along upper part of outer side of hind tibia thicker, denser, more numerous and altogether more conspicuous than in *pertiades*.

Tergite 1, by comparison with that of *pertiades*, strongly narrowed to apex (Text-fig. 46). Tergites (2 + 3)–6 more or less setose all over. Ovipositor sheath slightly longer.

MALAYA : Sepang, type locality (recorded as probably parasitic on *Tirathaba rufivena*). JAVA : long series in B.M. (N.H.) from *Tirathaba mundella*. FIJI : (no host data).

Type in the British Museum (Nat. Hist.).

Host : *Tirathaba rufivena* Walker, *Tirathaba mundella* Walker (Galleriidae).

Needs to be carefully distinguished from *pertiades* but certainly distinct from that species. Also closely related to *galleriae*.

Apanteles aglaus sp. n.

♀. In spite of having a pallid stigma, this species is, I think, fairly closely related to *pertiades*, having like that species tergite 1 not at all narrowed behind, the anterior part of the mesopleurum with sharp, discrete punctation and a line of rugosity extending downwards into the posterior depression of the mesopleurum from the subalar groove.

Eyes not at all convergent. Face smooth, impunctate and with a satin-like sheen. Vertex between the posterior ocellus and the eye-margin with distinct rugose-punctation. Temples quite strongly rugose-punctate. Antenna broken but evidently rather thin, with segment 13 almost twice as long as wide.

Mesoscutum weakly shiny and with a very fine punctation which is weaker on the middle lobe, leaving the surface here slightly more shiny. Disc of scutellum smooth, polished. Wings glass clear; median cell very sparsely setose. Propodeum having a rugose appearance; areolation not well defined; costula distinct but not sharply defined owing to surrounding rugosities. Outer side of hind coxa smooth, with satin-like sheen; hind tibia rather sharply reddish yellow on rather more than basal half; hind spurs reddish yellow, short, the inner one hardly reaching to middle of hind basal segment.

Tergite 1 almost parallel-sided, dull, rugose. Tergites (2 + 3)–6 with setae reduced almost to a single row on each tergite. Ovipositor sheath about two thirds as long as the hind tibia.

Length: ca. 2.5 mm. without ovipositor.

FIGI: Suva, 19.ii.1941, 1 ♀, the TYPE, (R. A. Lever).

Type in the British Museum (Nat. Hist.).

A poorly characterized species. Probably important for its recognition is the punctate anterior part of the mesopleurum in combination with the short ovipositor.

Apanteles taragamae Viereck

Apanteles (*Apanteles*) *taragamae* Viereck, 1912: 140.

Apanteles (*Apanteles*) *plusiae* Viereck, 1913: 557. [Syn. due to Gahan].

Apanteles homonae Rohwer, 1922: 53. [Syn. due to Gahan].

Apanteles targamae Viereck; Wilkinson, 1928a: 132.

♀. Hind femur uniformly infusate. Stigma pallid with a darker border.

Eyes not convergent. Face strongly shining, superficially impunctate. Vertex between the posterior ocellus and the eye-margin dull and finely rugose; immediately behind the ocelli there is the merest trace of transverse aciculation. Antenna rather short; segments 14–17 hardly longer than wide, somewhat loosely articulated, decidedly shiny and clothed with rather bristly pubescence.

Mesoscutum shiny, its punctation fine and somewhat blurred; posterior end of notaulic course very distinctly striate-punctate. Disc of scutellum highly polished, not particularly strongly narrowed behind and not conically raised here. Anterior part of mesopleurum shiny, with a coarse but very indistinct, confused punctation. Costula of the propodeum and its forks usually more or less clearly defined; the fields of the propodeum on the whole shiny and polished in spite of scattered rugosities. Hind spurs weak with the inner hardly reaching the middle of the basal tarsal segment. Metacarp rather short, about four times as long as its distance from the apex of the radial cell.

Tergite 1 always narrowed behind though the degree of narrowing is subject to considerable variation. Ovipositor sheath distinctly a little shorter than the hind tibia; ovipositor not unusually thick.

Length: ca. 2.8 mm. without ovipositor.

CEYLON. CHINA. INDIA. SIAM. JAVA. NEW GUINEA. PHILIPPINES.

Type in the U.S. National Museum.

Host : *Diacrisia obliqua* Walker (Arctiidae) (India). *Eucosma critica* (Eucosmidae) Meyrick, (India). *Cirphis unipunctata* Haworth (Phalaenidae) (Siam). *Margaronia indica* Saunders (Pyraustidae) (Ceylon & New Guinea). A gregarious parasite, making white, papery cocoons, loosely heaped together.

In well preserved specimens, the apical antenna segments have a characteristic shiny, bristly appearance. If these segments are collapsed, they appear longer and due allowance must be made for this.

A. taragamae can be taken as the typical representative of a complex of indo-oriental species that closely resemble one another. These species are, in fact, some of the most typical members of the *ater*-group, *taragamae* itself being very like the palearctic *ater*. As a complex, they are far removed from the predominantly African *metellus*-complex though they grade into it through a number of transitional species.

Apanteles clita sp. n.

♀. Extremely like *taragamae*, differing from it chiefly in having fine, but distinct transverse aciculation behind the ocelli, a slightly narrower hind wing and the ovipositor considerably thicker (Text-fig. 53). Other differences are as follows:—

Apical segments of the antenna very slightly more elongate and lacking the shiny, bristly appearance of *taragamae*. Metacarp a little longer, nearer to six times as long as its distance from the apex of the radial cell. Costula of the propodeum less distinct ; postero-lateral areas with more raised rugosities and hence less outstanding ; propodeum altogether a little longer than in *taragamae*.

Tergite 1 relatively longer and narrower.

Size as in *taragamae*.

INDIA : Pusa, Bihar, viii.1935, 8 ♀♀, one the TYPE, ex *Sylepta lunalis* ; 15.ix. 1919, 8 ♀♀, 1 ♂, ex *Bocchoris artificialis* ; United Provinces, Dehra Dun, series ex larva defoliating *Vitis vinifera*.

Type in the British Museum (Nat. Hist.).

Host : *Sylepta lunalis* Guenée (Pyrilidae) ; *Bocchoris artificialis* Lederer (Pyrilidae).

A gregarious species, spinning an elongate, tightly woven mass of cocoons, covered with silk.

Apanteles metagenes sp. n.

♀. This species is extremely like *clita*, having fine aciculation behind the ocelli, an ovipositor sheath of similar length and a thickened ovipositor. It differs from *taragamae* by the same characters as separate *clita* from *taragamae*.

The wings of *metagenes* are faintly darkened and the stigma is more or less evenly brown ; the venation is pigmented (hardly so in *clita*) and the setae dark and easy to see. The ovipositor is even thicker than in *clita* and is a characteristic feature of the species (cf. Text-fig. 53). Costula of the propodeum wanting.

INDIA : Madras, Nilambur, vii-viii., large series including the TYPE, ♀, bred from Pyralid larva defoliating *Leea*.

Type in the British Museum (Nat. Hist.).

Gregarious, making an elongate mass of cocoons, enveloping host larva. Perhaps only a variety of *clita*.

***Apanteles oritias* sp. n.**

Another species belonging to the *taragamae*-complex and differing from the species so far included in this complex only on a combination of very few characters.

♀. It may be compared with *taragamae* as follows:—

Face very distinctly, finely, closely punctate. Antenna a little shorter, with the apical segments more tightly articulated, lacking the shiny appearance of *taragamae* and with only normal, indistinct pubescence. No aciculation behind the ocelli.

Disc of scutellum slightly more flattened behind. Propodeum densely, rather evenly rugose, without trace of costula and with very poorly defined areola. Wings exactly as in *taragamae*. Mesopleurum with a slightly more distinct punctation in front.

Ovipositor sheath distinctly longer than the hind tibia. Ovipositor thin (Text-fig. 51).

Length: 2.5 mm. without ovipositor.

INDIA : United Provinces, Dehra Dun, Lachiwala, 5.vii.1937, 2 ♀♀, one the TYPE, 1 ♂, labelled "ex *Ficus* fruits", (*G. D. Bhasin*). CHINA : Changhing, 2 ♀♀, 2 ♂♂; these Chinese specimens have the hind tibia pale only at extreme base, whereas in the type series the basal half of the hind tibia is yellowish.

Type in the British Museum (Nat. Hist.).

***Apanteles stenno*s sp. n.**

Another species related to *taragamae* and its allies but differing from all of them in having a shorter ovipositor sheath with a short, thick ovipositor, constricted at apex (Text-fig. 84).

♀. May be compared with *taragamae* as follows:—

Antenna shorter, thinner with segments 16–17 distinctly a little longer than wide. Vertex behind the ocelli almost smooth. Mesoscutum behind showing as a zone of large, contiguous punctures among which there are no longitudinal elements. Stigma of fore wing entirely dark. Tergite 1 a little narrower than in *taragamae* and smoother.

Length: 2 mm. without ovipositor, smaller than any of the species so far mentioned as being related to *taragamae*.

INDIA : United Provinces, Dehra Dun, 6 ♀♀, one the TYPE, bred 28.iv.1937, from *Hysipyla robusta* in sack-bands on *Cedrella toona*. INDO-CHINA ; Phnompenh, ii.1951, 1 ♀, (*R. Paulian*).

Type in the British Museum (Nat. Hist.).

Host : *Hysipyla robusta* Moore (Phycitidae).

In the type-series, the costula of the propodeum is sometimes absent, sometimes present. It is absent in the female from Indo-China.

***Apanteles smerdis* sp. n.**

♀. Extremely like *taragamae* with which it may be compared as follows:—

Hind tarsus deeply infusate throughout.

Vertex immediately behind the ocelli shiny, with a few rugulosities but no trace of aciculation.

Temples more strongly rugose. Antenna more obviously shorter than the body with the apical segments very closely articulated ; segments 16-17 hardly longer than wide ; pubescence of flagellum extremely fine and quite inconspicuous.

Mesoscutum with a stronger, more even punctation. Disc of scutellum more narrowed behind and almost conically raised here. Costula of propodeum wanting. Thicker spines along upper part of outer side of hind tibia shorter and blunter. Metacarp a little longer in proportion to its distance from the apex of the radial cell.

Tergite 1 more sharply narrowed behind. Median field of tergite (2 + 3) unusually small. Ovipositor sheath fully as long as the hind tibia ; ovipositor slightly thinner than in *taragamae*. Length: 2.5 mm. without ovipositor.

PHILIPPINES : Luzon, Mt. Makiling, 1 ♀, the *TYPE*, (Baker).

Type in the U.S. National Museum.

Apanteles cerberus sp. n.

A large, more heavily built and more strongly sculptured species than *taragamae* and transitional between the *taragamae*-complex of species and the oriental species of the *metellus*-complex as represented by *opacus*.

♀. Hind coxa, hind trochanter, and hind femur entirely dark ; hind tibia almost blackish on apical half but becoming rather bright yellowish on basal half ; hind tarsus infusate, except base of segment 1.

Eyes not convergent. Face shiny but with coarse, indistinct rugose-punctation towards sides. Frons and vertex with some sort of rugosity everywhere ; behind the ocelli there are distinct traces of transverse aciculation. Antenna hardly shorter than the body ; rather thick, segment 17 being about one and a quarter times longer than wide.

Mesoscutum somewhat dull, densely punctate ; notaulic course showing as a dull, rugose band with hardly a trace of longitudinal elements at its posterior end. Disc of scutellum rather strongly narrowed behind, polished, weakly convex and with a few punctures towards sides and front. Areolation of propodeum complete. Anterior part of mesopleurum coarsely rugose ; towards posterior depression the surface shows simple punctation and some striation. Setae of the median cell colourless ; metacarp about four and a half times as long as its distance from the apex of the radial cell ; hind wing broad, the 2nd abscissa of the mediella distinctly shorter than the distance between its distal extremity and the apex of the vannal lobe.

Tergite 1 showing the same degree of apical narrowing as in *taragamae*. Ovipositor sheath about one and a quarter times longer than the hind tibia.

Length: 2.8 mm. without ovipositor.

INDIA : S. Coorg, Tithimatti, 30.x.1942, 2 ♀♀, one the *TYPE*, bred from *Hapalia ochracialis*, defoliating *Embelia robusta*.

Type in the British Museum (Nat. Hist.).

Host : *Hapalia ochracialis* Walker (Pyraustidae).

This species differs from *metagenes* in having a thinner ovipositor and pellucid stigma and from *oritias* in having a strongly areolated propodeum, *inter alia*. The broad hind wings are an important feature for its recognition.

Apanteles oenone sp. n.

Closely related to the species of the *taragamae* complex but differing from them all in having tergite 1 virtually quadrate.

♀. A very dark-legged species with the hind coxa, hind femur and hind trochaner almost black ; hind tibia equally dark except for a pale basal quarter.

Eyes not convergent. Face smooth, shining, with faint satin-like sheen. Frons and vertex with some sort of rugosity everywhere ; the rugulosity behind the ocelli shows no transverse elements in the type but there is a faint trace of transverse aciculation in the paratype. Antenna hardly as long as the body, rather thin and with the preapical segment about one and a quarter times longer than wide.

Mesoscutum shiny, rather heavily punctate and with a dull, more coarsely punctate zone at the posterior end of the notaulic course in which there is hardly a trace of longitudinal elements. Disc of scutellum smooth, polished. Propodeum rather short, with the costula more or less distinct, as in *taragamae*. Anterior part of the mesopleurum shiny, with large, contiguous punctures but towards tegulae simply rugose. Setae of the median cell colourless ; metacarp about four times longer than its distance from the apex of the radial cell ; hind wing rather broad, as in *taragamae*.

Tergite 1 strongly rugose all over (Text-fig. 48). Ovipositor sheath as long as the hind tibia. Length: 2.8 mm. without ovipositor.

AUSTRALIA : Queensland, Ayr, 15.vi.1949, 2 ♀♀, *TYPE* and paratype, bred from *Earias huegeli* (W.A.S.).

Type in the British Museum (Nat. Hist.).

Host : *Earias huegeli* Rogenhoffer (Phalaenidae).

Largely characterized by the strongly punctate, shiny mesoscutum and the shape of the first tergite.

Apanteles sauros sp. n.

♀. Hardly distinguishable from *oenone*, except on colour of hind legs. May be compared with *oenone* as follows:—

Hind tibia yellowish on basal half ; segments 2-4 of the hind tarsus dirty whitish yellow as is also the base of segment 1. Face with a trace of blurred punctation on each side above. Antenna thinner and relatively a little longer. Mesoscutum as shiny as in *oenone* but with a slightly finer punctation. Tergite 1 less strongly sculptured and slightly narrowed behind.

INDIA : Rawalpindi, 13.ii.1959, 1 ♀, the *TYPE*, ex larva of *Zizyphia* sp. Probably a solitary parasite.

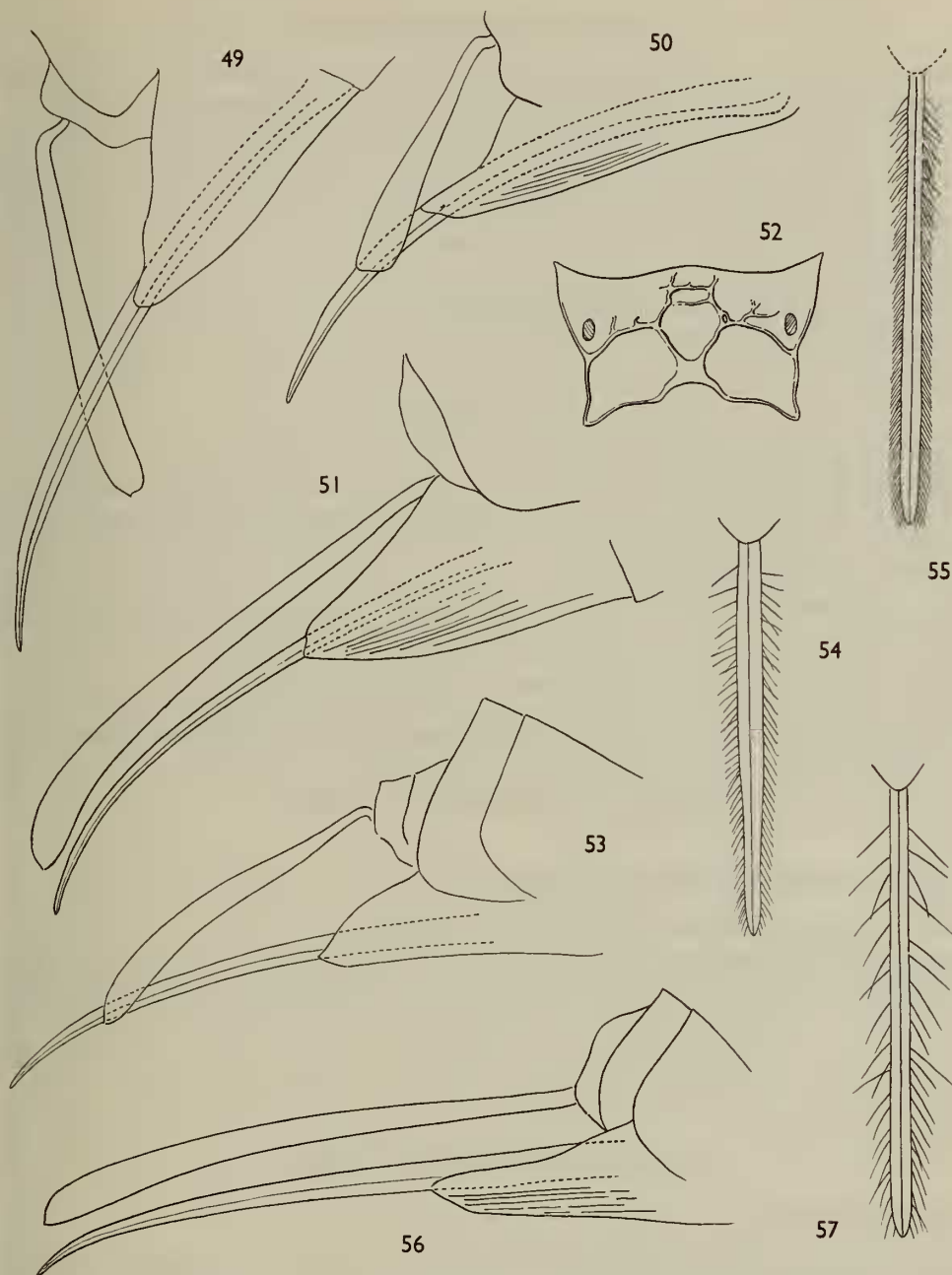
I have named as this species two females (Coimbatore, bred from *Eucelis* sp. (Olethreutidae) on Red Gram, 29.xi.1936) which agree well with the type female except that the hind leg is not so strikingly bicoloured.

Type in the British Museum (Nat. Hist.).

Host : *Zizyphia* sp. (Gelechiidae).

Were it not for its thinner antenna, and differently shaped first tergite, this species would be virtually indistinguishable from *taragamae*. The dull, sculptured frons and vertex are typical of all the species clustering around *taragamae*. The vertex behind the ocelli is without any trace of transverse aciculation.

Apanteles oenone and *sauros* may be merely local forms of the same species.



FIGS. 49-57. *Apanteles*, ♀: 49, *sagax* Wilkinson, ovipositor, lateral; 50, *florus* sp. n., same; 51, *oritias* sp. n., same; 52, *florus* sp. n., propodeum; 53, *clita* sp. n., ovipositor, lateral; 54, *importunus* Wilkinson, ovipositor sheath, from above; 55, *contemptus* sp. n., same; 56, *ortia* sp. n., ovipositor, lateral; 57, *saravus* sp. n., ovipositor sheath, from above.

Apanteles contemptus sp. n.

Here is another species closely related to *oenone* on account of having tergite 1 not narrowed posteriorly but distinct from it on a number of significant characters.

♀. The main differences have been given in the key ; there is little to add.

Frons and vertex much more finely sculptured than in *oenone*. Punctuation of mesoscutum much finer. Spines of the outer side of the hind tibia less obviously differentiated into two types. Ovipositor sheath distinctly a little longer than the hind tibia ; seen from above, the hairs of the sheath are short and dense (Text-fig. 55) ; in *oenone* and *sauros* they are longer and more upstanding.

MALAYA : Singapore, 1 ♀, the TYPE, (Baker).

Type in the U.S. National Museum.

Apanteles machaeralis Wilkinson

Apanteles machaeralis Wilkinson, 1928 : 123.

This species and the next (*tachardiae*) are essentially characterized by having tergite 1 virtually not narrowed behind and the propodeum without areolation apart from a weakly defined areola.

♀. Paler parts of the legs straw-yellow.

Frons and vertex faintly dull and very finely sculptured. Antenna hardly as long as the body, the more apical segments closely articulated, with segment 17 about one and a quarter times longer than wide ; pubescence of flagellum extremely fine.

Mesoscutum somewhat dull, its punctuation very fine and rather indistinct ; notaulic course showing as a dull, rugose band ; posteriorly the two bands are widened to form two large, contiguous areas of rugose-punctuation in which there are no longitudinal elements. Propodeum without trace of either costula or keels encircling the spiracle. Anterior part of mesopleurum dull, rugose, without punctuation. Metacarp rather short, about three times as long as its distance from the apex of the radial cell.

INDIA.

Type in the British Museum (Nat. Hist.).

Host : *Hapalia machaeralis* Walker (Pyraustidae).

This species and *sauros* are very much alike but *machaeralis* has the antenna slightly shorter and slightly thicker, the mesoscutum duller and more finely sculptured and the basal segment of the hind tarsus much more extensively yellow ; in *sauros* the yellow is restricted to the basal quarter. The ovipositor of *machaeralis* is distinctly shorter than that of *sauros*.

Apanteles tachardiae Cameron

Apanteles tachardiae Cameron, 1913 : 19.

Apanteles tachardiae Cameron ; Wilkinson, 1928 : 119.

The differences between this species and *machaeralis* have been adequately given in the key. There is very little to add.

♀. The paler parts of the legs are reddish rather than yellow (as in *machaeralis*). The metacarp is slightly longer.

INDIA.

Type in the British Museum (Nat. Hist.).

Host : Some Lepidopteron associated with lac.

This species differs from *sauros* by much the same characters as separate *machaeralis* from *sauros* except that the ovipositor of *tachardiae* and *sauros* are of the same length relative to the hind tibia.

Apanteles murcia sp. n.

♀. A further species with tergite 1 large and only weakly narrowed behind. Hind tibia reddish yellow and infuscate over slightly more than basal third.

Frons and vertex faintly dull and weakly sculptured, as in *machaeralis* and *tachardiae*. Antenna broken but to judge from the 14 existing segments clearly shorter than the body ; segment 14 about one and one third times longer than wide. Vertex behind the ocelli without trace of transverse aciculation.

Sculpture of mesoscutum as in *taragamae*, *clita* and closely related species. Disc of scutellum polished and rather wide behind. Propodeum short, rugose, with virtually no trace of a costula and the areola only weakly indicated. Metacarp about four times as long as its distance from the apex of the radial cell.

Horizontal surface of tergite 1 dull, with a fine, almost shagreened sculpture. At least distal half of ovipositor sheath, seen from above, with dense adpressed pubescence.

Length: ca. 2.5 mm. without ovipositor.

MALAYA : Singapore, 1 ♀, the TYPE, (Baker).

Type in the U.S. National Museum.

Characterized essentially by the shape and sculpture of the first tergite, and the short pubescence of the ovipositor sheath.

Apanteles importunus Wilkinson

Apanteles importunus Wilkinson, 1928 : 120.

♀. A species belonging to the *taragamae*-complex, differing from *taragamae* chiefly in having the sides of the propodeum remarkably free from sculpture.

No trace of aciculation behind the ocelli. Apical segments of antenna lacking the bristly appearance seen in *taragamae*. Ovipositor exactly as in *taragamae*, and showing no trace of an apical constriction, but a little longer ; the sheath clothed with shorter, less outstanding hairs (Text-fig. 54).

INDIA.

Type in the British Museum (Nat. Hist.).

Host : A species of *Nephoptyx* (Pyralidae) defoliating *Cassia fistula*. Recorded by Wilkinson as a solitary parasite, but possibly only on the evidence of a single cocoon being mounted with each specimen in the type series.

Characterized by the highly polished surface of propodeum on each side of the weakly defined areola and complete absence of costula.

Apanteles sagax Wilkinson

Apanteles sagax Wilkinson, 1929a : 111.

Clearly a member of the *taragamae*-complex of species but distinct on account of the

highly reduced areolation of the propodeum. This might cause the species to be confused with members of the *eublemmae*-subgroup, except that these have a dull appearance, whereas *sagax* is essentially a shiny looking species.

♀. Hind femur dark brown to black ; hind tibia whitish or yellowish on about basal quarter. Wings markedly hyaline.

Antenna rather short with the preapical segment about one and a quarter times longer than wide.

Sculpture of mesoscutum fine and indefinite, with the lines of the notaulices showing as duller, rugose bands, each of which terminates behind as a zone of delicate striate-punctuation, though the striate element is far from distinct. Propodeum rather long ; areola of propodeum in the form of an indistinct V, the surface on each side of which is strongly shining and more or less smooth. Metacarp about four times as long as its distance from the apex of the radial cell.

Tergite 1 and median field of tergite (2 + 3) (Text-fig. 40). Ovipositor decidedly thick (Text-fig. 49)

Length: 2.2–2.5 mm. without ovipositor.

TROPICAL AFRICA.

Type in the British Museum (Nat. Hist.).

Host : A gregarious parasite of *Sylepta derogata* Fab. (Pyraustidae).

This species is only distantly related to the other African species parasitizing *Sylepta derogata*, *A. syleptae* Ferrière, which has complete propodeal areolation and a rugose scutellar disc.

Apanteles ater (Ratzeburg)

Microgaster carbonarius Ratzeburg, 1848 [nec Wesmael, 1837] : 52.

Microgaster ater Ratzeburg, 1852 : 56 [n.n.].

Apanteles ater (Ratzeburg) Wilkinson, 1945 : 197.

♀. A dark-legged species ; the hind tibia becomes faintly paler on basal half. Stigma very pale brownish yellow with faintly darker border ; sometimes merely pallid with yellowish tint.

Face shining, smooth but often with faint satin-like sheen. Frons above and the vertex between the ocelli and the eye-margin smooth but slightly dull. Antenna shorter than the body, rather thick with at least segments 15–17 only very slightly longer than wide.

Mesoscutum somewhat shiny but duller and more finely, more sharply punctate in front ; a distinct zone of fine striate-punctuation at the posterior end of the notaulic courses. Disc of scutellum polished. Areolation of propodeum reduced ; costula at most feebly indicated but a more or less distinct oblique keel lies behind the spiracle. Spines of the outer side of the hind tibia weak, sparse, hardly differentiated into two types ; front tarsal segment 5 with a distinct spine (Text-fig. 20). Metacarp about four times as long as its distance from the apex of the radial cell.

Tergite 1 always distinctly narrowed behind, its horizontal surface dull and rugose but not strongly so (Text-fig. 45). Ovipositor sheath about three quarters as long as the hind tibia.

Length: 2.2–2.7 mm. without ovipositor.

EUROPE.

Host : *Cacoecia podana* Scopoli (Tortricidae) ; *Hyponomeuta malinellus* Zeller (Hyponomeutidae). *Notocelia uddmanniana* L. (Eucosmidae). *Cheimatobia brumata* L. (Geometridae). A gregarious parasite.

The small spine on the front tarsus is a very important feature of this species and a sure aid towards its recognition. I have not come across a similar spine in any

other species of the *ater*-group though I do not exclude the possibility of having overlooked such a spine. It occurs frequently in species belonging to other groups of *Apanteles*.

Dr. V. Tobias of Leningrad has kindly presented the British Museum (Nat. Hist.) with a series of three females and one male which I consider to be *ater*, though the specimens differ from the W. European examples in having the stigma pellucid, that is, whitish with a darker border, such as occurs in the European *xanthostigma* Haliday; *xanthostigma*, however, lacks the spine on the front tarsus. The three Russian females were bred gregariously from *Cacoecia xylosteana* L.

In most respects *ater* is closely related to the species I refer to as the *taragamae*-complex.

Apanteles galleriae Wilkinson

Apanteles galleriae Wilkinson, 1932a : 139.

As pointed out by Wilkinson, this species is very close to his *tirathabae*. The main differences have been given in couplet 119 of the key.

♀. Legs, on the whole, redder, the hind coxa being distinctly reddish brown.

Face slightly more transverse but equally shiny. At the posterior end of the notaulic course is a small zone of dull, rugose-punctuation in which there are no obvious longitudinal elements (quite different from *tirathabae*). Stigma (Text-fig. 66).

EUROPE. INDIA : Bangalore, 1 ♀, (with hind coxa almost black).

Host : *Galleria mellonella* L. (Galleriidae).

Both this species and *tirathabae* have the stigma unusually broad and the hind tibia densely spinose.

Apanteles carpatus (Say)

Microgaster carpata Say, 1836-37 : 263.

Apanteles carpatus (Say) Muesebeck, 1920 : 515.

This species is somewhat aberrant within the *ater*-group s.l. on account of the shape of tergite 1 (Text-fig. 59) and the presence of the extra propodeal keel (Text-fig. 61).

♀. Hind femur varying from yellowish- or reddish-brown to almost black.

Antenna segments 15-17 almost square in outline.

Costula of the propodeum weak to absent. Outer, upper surface of hind coxa dull, strongly rugose ; spines of outer side of hind tibia numerous but blunt. Stigma broad (Text-fig. 1).

Tergite 1 sometimes distinctly widened behind.

COSMOPOLITAN.

Host : *Tinea pellionella* L. and *Trichophaga tapetzella* L. (both hosts recorded for U.S.A. by Muesebeck, 1920), *Tineola biselliella* Hübner, *Tinea fuscipunctella* Haworth, (Tineidae).

This species could be confused with *piceoventris* but this last has no extra propodeal keel, a narrower first tergite and a differently shaped vannal lobe.

Apanteles angaleti Muesebeck

Apanteles angaleti Muesebeck, 1956 : 61.

♀. A dark-legged species with the hind tibia becoming gradually paler proximal to middle ; except for the base of the first segment, the hind tarsus is deeply infusate throughout.

Eyes not convergent. Face shiny and with traces of very superficial punctation. Frons and vertex faintly dull with fine rugosity ; the rugosity extensive behind the ocelli but no trace of aciculation here. Antenna clearly shorter than the body with the more apical segments closely articulated.

Mesoscutum faintly shining and with fine punctation similar to that of such species as *tachardiae* and *machaeralis*, not at all characteristic. Disc of scutellum polished, somewhat flattened and rather wide behind. Areolation of propodeum reduced to a very ill defined areola. Metacarp fully five times as long as its distance from the apex of the radial cell.

Tergites 1 and (2 + 3), (Text-fig. 16). Ovipositor rather thin.

Length: 2.8 mm. without ovipositor.

PAKISTAN : Phularwan. INDIA : Karnal (type loc.). SUMATRA : Fort de Kock.

Type in U.S. National Museum.

Host : *Sylepta derogata* F. (Pyraustidae) : *Pectinophora gossypiella* Saunders (Gelechiidae).

Being completely without trace of costulae, the propodeum of this species is characteristic ; on the whole, it presents a dull, rather finely sculptured surface which, on each side of the arms of the areola tends to become smoother and shows vague, transverse striation. Sculpture of the propodeum very similar to that of the first tergite.

Transitional between the species of the *taragamae*-complex with their narrowed first tergite, and *machaeralis* and *tachardiae* with their reduced propodeal areolation.

The long ovipositor is an important character for the recognition of the species.

Apanteles nephereus sp. n.

♀. Very like the previous species—*angaleti*. There is very little to add to what has already been given in the key.

Antenna shorter, only about two thirds as long as the body ; segments 16–17 square in outline.

Mesoscutum slightly less transverse. Suture between disc of scutellum and mesoscutum costate ; in *angaleti* it appears to consist of a row of foveae but the specific difference is not strong. Disc of scutellum slightly more narrowed behind. Propodeum smooth. Sculpture of anterior part of mesopleurum consisting of coarse but distinct punctation ; in *angaleti*, the surface here shows simple rugosity. Metacarp very slightly shorter. Hairs of the ovipositor sheath as in *angaleti*.

PHILIPPINES : Los Baños, 1 ♀, the TYPE, (Baker).

Type in the U.S. National Museum.

Apanteles araeceri Wilkinson

Apanteles araeceri Wilkinson, 1928a : 118.

♀. Wings less hyaline than in *taragamae* and its allies ; setae distinctly brownish.

Eyes not convergent. Face somewhat flattened, its punctation strong. Mesoscutum somewhat dull, strongly and rather coarsely punctate. Tergite 1 not narrowed behind.

JAVA (type locality). MALAYA : I. of Penang, 1 ♀, (*Baker*).

Type in the British Museum (Nat. Hist.).

Host : Recorded by Wilkinson as having been bred from *Araecerus fasciculatus* de Geer (Coleoptera, Anthribidae). This host needs verification.

The appearance of the mesoscutum is somewhat characteristic and this, in combination with the shape of the first tergite and long, thin ovipositor, makes the species distinctive. I know of no species with which *araeceri* could easily be confused though it shows some affinity with the following species, *chloris*.

Apanteles chloris sp. n.

♀. Hind coxa brown, becoming yellowish at tip ; hind femur entirely yellow ; hind tibia yellow with infusate tip. Stigma evenly brown.

Head in a facial view somewhat transverse. Face itself transverse, dull, densely, rather shallowly punctate. Vertex between the ocelli and the eye-margin, and the temples, faintly shiny, almost with satin-like sheen ; weakly punctate to rugose-punctate. Antenna about as long as the body, rather thin, with the preapical segment fully one and a half times longer than wide.

Mesoscutum closely, densely punctate ; the sculpture has an even appearance and there is hardly a trace of longitudinal elements at the posterior end of the imaginary course of the notaulices. Disc of scutellum shiny, strongly narrowed behind and with scattered punctures of irregular shape. Propodeum dull, rugose, with areola but without clearly indicated costula. Spines of the outer side of the hind tibia sparse, fine.

Tergite 1 about one and a third times longer than its medial width, hardly narrowed behind ; virtually no furrow on its posterior horizontal part which is dull and rather finely rugose (Text-fig. 79). Ovipositor sheath very slightly longer than the hind tibia, its hairs not at all upstanding.

Length: ca. 3 mm. without ovipositor.

PHILIPPINES : Mindañao, Surigao, 2 ♀♀, one the *TYPE*, (*Baker*).

Type in the U.S. National Museum.

This species has much in common with *araeceri*, resembling that species in the sculpture of the propodeum and the shape of the basal tergites. It differs from *araeceri* at once in having a shorter ovipositor sheath, more evenly sculptured mesoscutum and longer apical flagellar segments.

Apanteles tulis sp. n.

♀. Hind tibia becoming paler on about basal third ; hind tarsus infusate more or less throughout. Wings hardly hyaline, the setae brownish.

Eyes not convergent. Face shiny with a satin-like sheen. Frons and vertex with satin-like sheen. Temples almost rugose-punctate. Antenna broken but to judge from the ten existing segments, probably not much shorter than the body. Disc of scutellum polished, moderately wide behind. Costula of the propodeum very faintly indicated, the area posterior to it highly shining, almost polished, as is also the areola. Metacarp between four and five times as long as its distance from the apex of the radial cell.

Ovipositor sheath about one and one third times longer than the hind tibia, its hairs even in length and at least on basal two thirds, semi-erect.

Length: ca. 2.6 mm. without ovipositor.

PHILIPPINES : Island of Basilan, 1 ♀, the *TYPE*, (*Baker*).

Type in the U.S. National Museum.

Perhaps related to *araeceri* on the shape of the first tergite. Not a very distinctive looking species but probably characterized to some extent by the length of the median field of tergite (2 + 3) in relation to the length of the rest of the tergite.

Apanteles orus sp. n.

This species is like *leptoura* in having a strongly sculptured head.

♀. Hind tibia deeply infusate almost throughout, only very faintly paler at extreme base. Setae of the fore wing slightly darker. Antenna broken but evidently long, with segment 15 twice as long as wide.

PHILIPPINES : Luzon, Mt. Makiling, 1 ♀, the *TYPE*, (*Baker*).

Type in the U.S. National Museum.

Apanteles eriphyle sp. n.

♀. Another species with coarsely rugose-punctate frons and vertex, more closely resembling *orus* than *leptoura* on account of the sculpture of the mesoscutum, long metacarp and strongly narrowed first tergite.

Stigma almost evenly brown.

Head thicker from back to front than in *orus*. Antenna as long as the body, somewhat tapering towards apex, with segment 14 about two and a half times longer than wide ; flagellum rather bristly. Spines of the outer side of the hind tibia more numerous and more upstanding than in *orus*. Ovipositor sheath downcurved towards apex, clothed densely with short, almost adpressed hairs ; these hairs are slightly more erect in *orus*.

PHILIPPINES : Los Baños, 2 ♀♀, one the *TYPE*, (*Baker*).

Type in the U.S. National Museum.

I have no doubts about the specific validity of *eriphyle* and *orus*. Neither of them is easily confused with any other species dealt with in this paper.

Apanteles tigasis sp. n.

♀. Another species related to *orus* and *eriphyle* as well as to the *leptoura*-complex but differs from all these species in the combination of entirely dark stigma and narrower hind wing.

Hind femur brown ; hind tibia becoming yellowish on rather more than basal half ; hind tarsus deeply infusate throughout.

Face and clypeus much flattened ; face with large, somewhat irregular punctures that are more crowded towards the middle line. Antenna broken but the existing segments indicate a decidedly bristly flagellum.

Mesoscutum sharply punctate ; the punctures fairly large and well separated ; at posterior end of notaulic course is a distinct zone of striate-punctuation. Disc of scutellum rather strongly narrowed behind, polished and virtually without trace of sculpture. Propodeum rather short, with the costula weakly indicated ; postero-lateral areas distinctly transverse. Hind tarsus with distinctly bristly appearance.

Horizontal part of tergite 1 dull, owing to microscopic surface sculpture and covered with oblong punctures ; a deep, medial furrow present.

SUMATRA : Fort de Kock, 920 m. 1925, 1 ♀, the *TYPE*, (*Jacobson*).

Type in the British Museum (Nat. Hist.).

Apanteles townesi sp. n.

♀. This species is related to *eriphyle* and *orus* but differs from them in the combination of heavily blackened stigma and an ovipositor sheath that is not longer than the hind tibia. In this combination of characters it approaches closely *tigasis* with which it may be compared as follows:—

Hind femur reddish-yellow except for apical infuscation that covers slightly more than distal quarter. Hind tarsus less deeply infusate.

Face and clypeus having the same flattened appearance as in *tigasis* but the punctation of the face finer and more even. Head slightly less transverse and the punctation of the vertex and temples stronger.

Punctation of mesoscutum stronger, the general surface duller and with clearer indication of microscopic surface sculpture. Disc of scutellum conspicuously punctate around sides. Black setae of the fore wing particularly conspicuous, giving the wing almost a bristly appearance; these setae are especially conspicuous along the costal margin. Flange beneath the hind tarsus much deeper and more conspicuous than in *tigasis*.

PHILIPPINES: Negros or., Mt. Canlaon, 29.iv.1953, 1 ♀, the *TYPE*, (*H. M. & D. Townes*).

Type in Coll. Townes.

The furrow between the mesocutum and the disc of the scutellum is much wider and deeper in this species than in *orus* and *eriphyle*, in which two species it tends to be shallowly foveate rather than costate. *A. tigasis* has this furrow much as in *townesi*.

Apanteles phycodis Viereck

Apanteles (Apanteles) phycodis Viereck, 1913: 557.

Apanteles phycodis Viereck; Wilkinson, 1928a: 117.

♀. Hind femur yellow; hind tibia yellow tipped with infuscation. Wings glass-clear; setae of the median cell colourless.

Eyes not convergent. Face dull, closely punctate. Frons above, vertex and temples dull, closely, evenly rugose-punctate to rugose-reticulate. Occiput behind the ocelli with a broad, longitudinal furrow that extends upwards between the ocelli and above is finely, transversely striate. Antenna distinctly shorter than the body, the preapical segment hardly one and a quarter times longer than wide.

Mesoscutum shiny but its punctation strong, almost coarse, with distinct striate-punctation at posterior end of notaulic course. Disc of scutellum coarsely punctate but becoming striate-punctate towards sides. Propodeum with much coarse rugosity; the areola narrow or even slightly constricted below and formed by very irregular keels; triangular in outline with its anterior corners subtly prominent; costula hardly indicated. Mesopleurum with strong, almost discrete punctation all over; surface of mesopleurum with an unusually large area of pubescence, only a small zone medially against the posterior margin being hairless. First abscissa of the radius rather strongly oblique and forming with the transverse cubitus an even curve; metacarp nearly four times as long as its distance from the apex of the radial cell. Thicker spines along upper part of outer side of hind tibia extremely sparse; hind tarsal segment 4 very short in comparison with segment 5 (Text-fig. 32).

Tergite 1 large, parallel-sided or even slightly widened behind, its horizontal surface covered with coarse, shiny, rugosity. Ovipositor sheath about one and one third times longer than the hind tibia, with numerous long, upstanding hairs as well as short ones.

Length: ca. 3 mm. without ovipositor.

INDIA : Bangalore (type locality) ; Coimbatore, 12.x.1923, 2 ♀♀, bred from *Phycodes radiata* on *Ficus bengalensis* (in B.M.N.H.) ; Samalbat, 25.x.1927, 1 ♀, 1 ♂, bred from *Phycodes* sp. (V. T. Rao).

Type in the U.S. National Museum.

Host : *Phycodes radiata* Ochs. (Glyphipterygidae).

A most distinct species on account of the structure of the vertex, propodeum and first tergite.

Apanteles cebes sp. n.

♀. Legs yellowish brown ; hind tibia showing a hardly noticeable increase in infuscation towards apex.

Eyes not convergent, wide apart on the face. Face dull, finely, closely punctate. Antenna about three quarters as long as the body, thick, imperceptibly thickened apically, with the more apical segments closely articulated and segments 16-17 very slightly transverse ; the flagellum appears faintly greyish owing to an excessively fine, adpressed pubescence.

Propodeum short, dull, with considerable fine rugosity ; in one specimen out of three, a costula is faintly indicated. Median cell very densely setose, though the setae are more or less colourless, hard to see ; metacarp fully five times as long as its distance from the apex of the radial cell. Thicker spines along upper part of outer side of hind tibia rather sparse, not sharply differentiated from the finer spines adjacent to them.

Horizontal part of tergite 1 polished medially, indistinctly punctate towards sides. Ovipositor sheath very slightly longer than the hind tibia, ca. 25 : 23 and, except at base, closed only with short, almost adpressed hairs.

Length: 2.5 mm. without ovipositor.

PHILIPPINES : Baguio, Benguet, 3 ♀♀, one the *TYPE*, (Baker).

Type in U.S. National Museum.

A subtly distinctive species and somewhat isolated. It is largely characterized by the appearance of the head combined with the thick antenna. The densely setose median cell is also important for its recognition. I am inclined to think that it comes closer to the *leptoura*-group than to the *taragamae*-complex.

Apanteles psenes sp. n.

♀. Hind tarsus very pale yellow, the segments with faint apical infuscation.

Face impunctate but with satin-like sheen. Frons, vertex and temples hardly roughened but dull and with a satin-like sheen. Antenna rather thin, with segments 16-17 very slightly longer than wide ; in one of the two females, the flagellum, being not at all shrunken, shows a hardly perceptible apical thickening.

Propodeum completely but rather weakly areolated. Fore wing faintly brownish ; medial cell densely setose all over, the setae dark ; hind wing rather narrow.

Tergite 1 (Text-fig. 42), coarsely rugose. Ovipositor sheath slightly longer than the hind tibia.

Length: 2.4 mm. without ovipositor.

MALAYA : Parit Buntar, 2 ♀♀, one the *TYPE*, 4 ♂♂, 9.xii.1930, (G. H. Corbett).

Type in the British Museum (Nat. Hist.).

A distinctive little species, largely characterized by the sculpture of the head in combination with the very pale legs. Not closely related to the *taragamae*-complex of species.

Apanteles ortia sp. n.

♀. Hind tibia yellowish brown, becoming a little paler towards base.

Eyes not convergent. Face smooth, shining. Upper part of frons and vertex dull and rather strongly rugose. Scape yellowish; antenna almost as long as the body with segment 17 about one and a half times longer than wide.

Mesoscutum with decidedly coarse rugose-punctuation. Disc of scutellum polished. Propodeum having a densely rugose appearance; areola weakly defined and costula also very weak. Seen from the side, the thorax is somewhat flattened dorso-ventrally and is elongate by comparison with *salutifer* and *florus*.

Tergite 1 narrow, distinctly a little narrowed behind.

Length: ca. 3 mm. without ovipositor.

SOLOMON IS : Ugi I., 6.v.1934, 11 ♀, one the *TYPE*, 1 ♂, (*R. A. Lever*).

Type in the British Museum (Nat. Hist.).

This is a gregarious parasite, making thin, papery cocoons, loosely heaped together. It is characterized by the polished, weakly transverse median field of tergite (2 + 3) and the long, thick ovipositor. Seems to be fairly closely related to *salutifer* and *florus* but is distinct from these species, *inter alia*, on the shape of the basal tergites of the gaster.

Apanteles saravus sp. n.

♀. Legs obscure brownish throughout. Wings faintly brownish; stigma pale brownish yellow with a faintly darker border; venation similarly coloured.

Face smooth, shining, impunctate.

Notaulic course behind showing striate-punctuation. Areolation of propodeum on the whole sharply defined; keels bounding the areola particularly sharp. Median cell densely setose all over; metacarp fully six times as long as its distance from the apex of the radial cell. Inner spur of the hind tibia hardly longer than the outer one.

Ovipositor sheath about as long as the hind tibia, its hairs long, upstanding (Text-fig. 57).

Length: ca. 2.33 mm. without ovipositor.

PHILIPPINES : Imugin, N. Viscaya, 5 ♀♀, one the *TYPE*; Luzon, Mt. Makiling, 1 ♀, (all *Baker*).

Type in the U.S. National Museum.

This species appears to belong to a small complex, not perhaps very closely knit, occurring in the Indo-Australian region and essentially characterized by certain details of wing structure. The wings are markedly brownish and have their setae brown and easy to see; the median cell is densely setose all over; the hind wing is narrow, with the cubitellian cell somewhat elongate (Text-fig. 15).

The sparseness of noticeably thicker spines along the upper surface of the hind tibia is a useful aid to the recognition of *saravus*.

Apanteles usipetes sp. n.

♀. Like *saravus*, this species has the ocelli in a low triangle with the transverse tangent to the anterior ocellus virtually touching the posterior pair. Differs from *saravus* as follows:—

Legs paler with the hind femur dingy yellow.

Eyes larger and closer together on the face. Antenna very slightly thickened apically with the

preapical segment hardly one and a quarter times longer than wide ; this segment is nearer to one and half times longer than wide in *saravus*.

Punctuation of mesoscutum tending to fade out posteriorly but the punctures on posterior half larger and further apart than those in front ; no trace of striate-punctuation at posterior end of notaulic course. Mesopleurum with distinctly discrete sternaulus, faintly roughened ; in *saravus*, this part shows merely the normal depression.

Ovipositor sheath about one and a quarter times longer than the hind tibia, the hairs upstanding and not quite so long as in *saravus* (cf. Text-fig. 57).

BORNEO : Sandakan, 1 ♀, the *TYPE*, (*Baker*).

Type in the U.S. National Museum.

Apanteles pisenor sp. n.

♀. The main differences between this species and *stenotelas* have been indicated in the key. The difference in the punctuation of the mesoscutum is striking and on this character alone, confusion between the two species is unlikely.

The antennae of the single specimen of *pisenor* are broken but the 15 segments existing in the right antenna indicate that the antenna is fully as long as the body, very slightly thickened towards apex and with segment 15 virtually square in outline.

Length: ca. 2.3 mm. without ovipositor.

NEW HEBRIDES : Banks I., Vanua Lava, x.1929, 1 ♀, the *TYPE*, (*L. E. Cheesman*).

Type in the British Museum (Nat. Hist.).

This species is also very like *usipetes* but the eyes are further apart, the punctuation of the mesoscutum is closer and tergite 1 is only slightly narrowed behind. In *usipetes*, tergite 1 is rather strongly narrowed behind and the median field of tergite (2 + 3) is less transverse than in *pisenor*.

Apanteles stenotelas sp. n.

♀. A most distinctive species on account of its small size combined with the large markedly discrete punctures of the mesoscutum.

Head from in front (Text-fig. 34). Hind wing narrower than in the allied species (cf. Text-fig. 15).

Length: ca. 1.9 mm. without ovipositor.

NEW HEBRIDES : Espiritu Santo, 2 ♀♀, one the *TYPE*, 5 ♂♂, bred from *Hymenia recurvalis*, (*R. A. Lever*).

Type in the British Museum (Nat. Hist.).

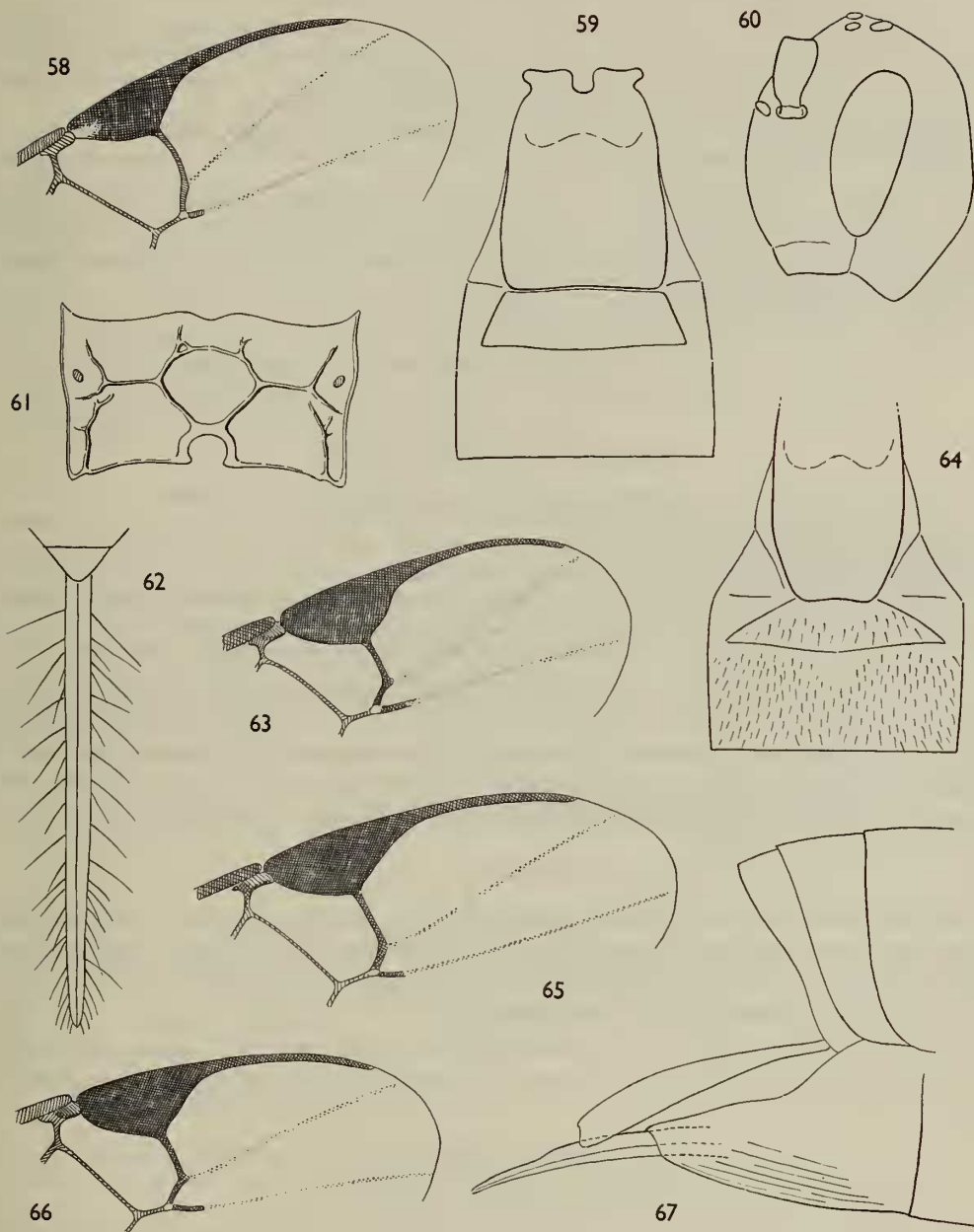
Host : *Hymenia recurvalis* F. (Pyralidae).

Apanteles piceoventris Muesebeck

Urogaster solitarius Ashmead, 1900, [nec Ratzeburg, 1844] : 287 [n. n.].

Apanteles piceoventris Muesebeck, 1920 : 515.

♀. Rather far removed from the preceding species (*saravus*, *usipetes*, *pisenor*, *stenotelas*) and subtly distinctive with its rather short, decidedly thick antenna and deep, rugose, sharply discrete sternaulus.



FIGS. 58-67. *Apanteles*, ♀: 58, *significans* (Walker), fore wing, part; 59, *carpatus* (Say), basal tergites; 60, *trachalus* sp. n., head, three quarter view, lateral; 61, *carpatus* (Say), propodeum; 62, *pertiades* sp. n., ovipositor sheath, from above; 63, *piceoventris* Muesebeck, fore wing, part; 64, *aglaope* sp. n., basal tergites; 65, *pertiades* sp. n., fore wing, part; 66, *galleriae* Wilkinson, same; 67, *aglaope* sp. n., ovipositor, lateral.

Legs yellowish to brownish yellow without any sharply darkened areas.

Wings nearly hyaline ; a distinct angle between the first abscissa of the radius and the transverse cubitus ; stigma rather broad (Text-fig. 63). Propodeum without sharp areolation but showing considerable rugosity ; costula and areola poorly defined. Upper surface of hind coxa dull, rugose, the sculpture changing to longitudinal striation towards trochanter.

Ovipositor sheath about as long as the hind tibia, its hairs long, upstanding.

Length: ca. 2.5 mm. without ovipositor.

W. INDIES : Grenada (type loc.). AFRICA : Zanzibar, i-ii.1925, 1 ♀, (*H. J. Snell*) ; Gold Coast, Accra, viii.1920, 1 ♀, (*A. Ingram*). FIJI Is : Toga, vii.1952, 1 ♀, (*R. A. Lever*). MALAYA : 1 ♀, bred from *Doloessa viridis* in stored rice and bran.

Type in the British Museum (Nat. Hist.).

Host : *Doloessa viridis* Zeller (Pyrilidae).

This is evidently a pantropical species associated with stored products.

Apanteles trachalus sp. n.

♀. Closely resembles *piceovenstris* with which it may be compared as follows:—

Face entirely black. Legs darker, brownish rather than yellowish. Gaster, as in *piceovenstris*, brownish rather than blackish.

Head deeper from back to front. Eyes (Text-fig. 60).

Antenna a little longer ; 3-4 basal segments of flagellum very slightly widened apically so that the flagellum at base does not appear so evenly cylindrical as in *piceovenstris*.

Sternaulus shorter, oblong-oval, less sharply discrete and more coarsely rugose.

ENGLAND : Lancs., Baston Dock, 12.xi.1941, 1 ♀, the *TYPE*, bred probably from larva of *Endrosis lactella* on peas and beans (*J. A. Freeman*) ; Liverpool, 6 ♀♀, found associated with *Endrosis* ; London, Victoria Docks, 1 ♀, in association with *Plodia interpunctella* and *Endrosis sarcitrella*. SCOTLAND : Glasgow, 4 ♀♀, found in association with *Borkhausenia pseudospretella*. WALES : Glamorgan, 3 ♀♀, N. IRELAND : Belfast, 8 ♀♀.

Type in the British Museum (Nat. Hist.).

Host : Associated with the following pests of stored products:— *Borkhausenia pseudospretella* Stainton, *Endrosis lactella* Schiffermueller, *Endrosis sarcitrella* L. (Oecophoridae) ; *Ephestia kühniella* Zeller, *Plodia interpunctella* Hübner (Phycitidae). Actual host preferences not yet established.

This is probably a species introduced to Great Britain. It is closely related to *piceovenstris* but it easily separated from it by the two characters given in the key.

Apanteles elagabalus sp. n.

♀. There is little to add to what has already been given in the key. Species much more closely related to *pisenor* and *usipetes* than to *piceovenstris* and *trachalus*, having the face smooth and shining.

Hind tibia deep yellow, rather sharply darkened on apical third. Metacarp about seven times as long as its distance from the apex of the radial cell ; radial cell narrower than in *piceovenstris* and stigma also narrower. Hind coxa above almost smooth. Ovipositor sheath distinctly a little longer than the hind tibia.

PHILIPPINES : Benaue, Mt. Prov. 31.xii.1943, 1 ♀, the *TYPE*, (*H. K. & D. Townes*).

Type in Coll. Townes.

Apanteles coretas sp. n.

♀. Distinct on account of the clearly fringed vannal lobe. Hind femur bright yellow but the hind coxa deeply infuscate throughout. Wings very noticeably brownish ; stigma yellowish brown.

Top of head, including temples, highly polished and in very sharp contrast with the closely punctate, but shiny mesoscutum. At posterior end of notaulic course, the punctures become large and somewhat separated but there is no trace of longitudinal elements. Propodeum very strongly, almost coarsely areolated ; the strength of the areolation of the propodeum reminds more of the species of the *metellus*-complex than those clustering around *saravus*. Metacarp about five times as long as its distance from the apex of the radial cell.

Ovipositor sheath slightly longer than the hind tibia.

NEW HEBRIDES : Santo, viii-ix.1929, 1 ♀, the *TYPE*, (*L. E. Cheesman*).

Type in the British Museum (Nat. Hist.).

Apanteles argiope sp. n.

♀. This is an aberrant member of the *metellus*-complex of species and is essentially characterized by the short metacarp in combination with the form of the vannal lobe ; beyond its widest part, the vannal lobe has a virtually straight edge with sparse projecting hairs along almost its entire length.

Legs on the whole dark with the hind femur brown throughout ; hind tibia becoming yellowish brown on about basal third. Wings markedly brownish.

Face shiny but distinctly, densely punctate. Antenna rather short, the preapical segment hardly longer than wide.

Disc of scutellum shiny and almost impunctate. Propodeum very coarsely rugose, the areola deep, large ; costula irregular and not always clearly defined. Abscissa 1 of the radius leaving stigma markedly distal to middle and very obliquely placed on the stigma (Text-fig. 31).

Gaster thickly pubescent. Tergites 1 and (2 + 3), (Text-fig. 38). Ovipositor sheath as long as the hind tibia.

Length: ca. 2.8 mm. without ovipositor.

S. AFRICA : Cape Province, numerous examples, all females, one the *TYPE*, Mossel Bay, 10.i.1939, (*R. E. Turner*). AUSTRALIA : S.E. Queensland, Tambourine Mts., 1 ♀, (this female has about basal two thirds of hind femur reddish yellow). MALAYA : Kuala Lumpur, 1 ♀ ; Singapore, 1 ♂, I. of Penang, 1 ♀. CELEBES. FIJI Is : Tonga, 2 ♀♀, one ex *Crocitolonia* sp. NEW HEBRIDES. PHILIPPINES : Luzon, Mt. Makiling, 3 ♀♀, 7 ♂♂.

Type in the British Museum (Nat. Hist.).

The African examples seem to have the metacarp slightly shorter in relation to its distance from the apex of the radial cell than the Indo-Australian specimens.

Apanteles dryas sp. n.

♀. In having a weakly fringed vannal lobe and in the shape of the head, the sculpture of the mesoscutum and propodeum, this species is rather closely related to *argiope*. It differs from *argiope* as follows:—

Legs more brightly coloured, the hind femur reddish yellow on fully basal half. Tergite (2 + 3) beyond the median field largely yellowish though infuscate medially. Wings less brownish.

Face quite dull, densely, finely punctate.

Punctuation of mesoscutum coarser. Areolation of propodeum stronger, more sharply defined. Wings relatively a little broader; metacarp about three and a half times longer than its distance from the apex of the radial cell.

Tergite 1 a little broader and more coarsely sculptured.

CHINA: Pekin, 2 ♀♀, one the *TYPE*, 1 ♂, labelled "on aster and polygonum", 1 ♀, 2 ♂♂, labelled "from Polygonum", (N. Gist Gee Coll.).

Type in the U.S. National Museum.

Apanteles hymeniae Wilkinson

Apanteles hymeniae Wilkinson, 1935: 267.

♀. An aberrant species of the *metellus*-complex, characterized essentially by the weakly transverse, heavily rugose median field of tergite (2 + 3) and the bright yellow legs.

Antennal scape yellow except for a darkened rim. Top of head smooth, polished. The large eyes are distinctly though not strongly convergent below. Areolation of propodeum very strong. Ovipositor sheath about two thirds as long as the hind tibia.

Length: ca. 3 mm. without ovipositor.

FIJI Is.

Type in the British Museum (Nat. Hist.).

Host: *Hymenia fascialis* Stoll, now *recurvalis* F. (Pyralidae) on silver beet.

This is a most distinct species, especially on account of the shape and coarse sculpture of the median field of tergite (2 + 3). I know of no other species with which it could be confused.

Apanteles lanassa sp. n.

♀. Hind tarsus as yellow as the hind tibia.

Eyes not convergent. Face dull, rather strongly punctate; the punctuation coarser beneath each antennal socket. Antenna almost as long as the body, rather thin and with the preapical segment fully one and half times longer than wide.

Disc of scutellum coarsely punctate towards sides. Metacarp about five times as long as its distance from the apex of the radial cell; hind wing broad.

Tergite 1 distinctly a little narrowed behind, its horizontal part shiny, strongly rugose with a smooth, medial trough. Median field of tergite (2 + 3) not strongly transverse, smooth, polished. Ovipositor considerably thickened.

Length: ca. 3 mm. without ovipositor.

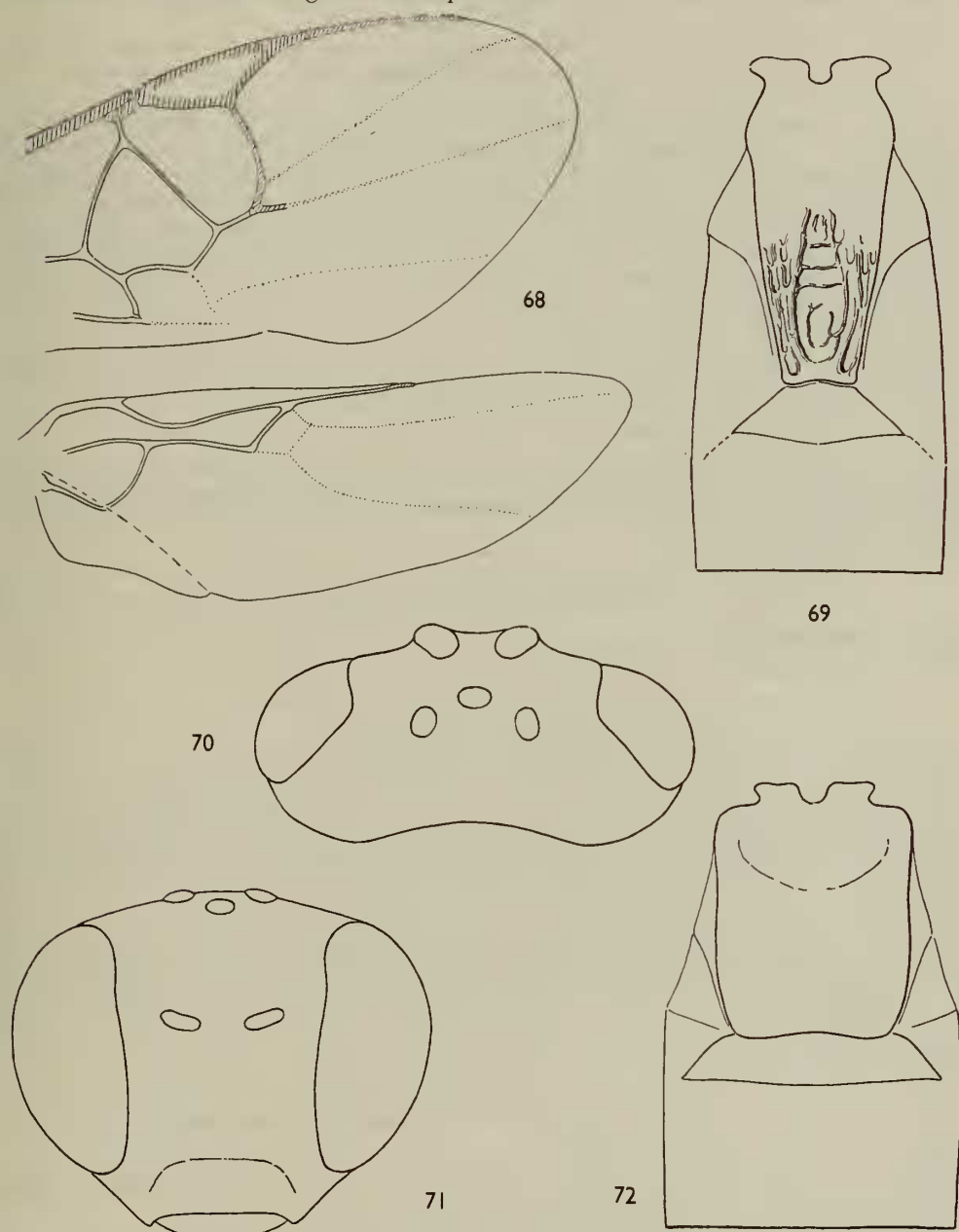
MALAYA: Kuala Lumpur, 1 ♀, the *TYPE*, bred 30.vi.1925, from *Sylepta derogata*, (G. H. Corbett).

Type in the British Museum (Nat. Hist.).

Host: *Sylepta derogata* F. (Pyraustidae).

This species seems to be fairly closely related to the African *syleptae* which is also a parasite of *Sylepta derogata* but the differences between them are certainly of specific value. Apart from obvious differences in colour, *syleptae* has the top of the head almost smooth; finer, more extensive sculpture on disc of scutellum, a more

transverse median field on tergite (2 + 3) and a very slightly thinner ovipositor. In many respects, *lanassa* is also related to *dores* but there is an easily appreciated difference in the much longer metacarp of *dores*.



FIGS. 68-72. *Apanteles*, ♀: 68, *goron* sp. n., wings; 69, *erse* sp. n., basal tergites; 70, *telon* sp. n., head, from above; 71, *erse* sp. n., head, from in front; 72, *leptoura* Cameron, basal tergites.

Apanteles telon sp. n.

♀. A distinctive species, characterized largely by its strongly transverse head with its smooth-looking, only faintly dull upper surface (Text-fig. 70).

Hind femur and apical two thirds of hind tibia infuscate.

Face shiny, distinctly but rather superficially punctate. Antenna broken in all specimens but the 15 segments existing in one female indicate an antenna that is almost as long as the body, rather thin and with segment 15 fully twice as long as wide.

Middle lobe of the mesoscutum shiny in spite of its strong punctation. Posterior end of the notaulic course showing as a zone of conspicuous striate-punctation. Disc of scutellum highly polished and with a few inconspicuous punctures along sides. Areolation of the propodeum reduced; costula wanting; posterior areas showing much raised rugosity. Venation of fore wing as in *goron* (cf. Text-fig. 68); abscissa 1 of the radius very long, about twice as long as the transverse cubitus and forming with it an even curve; hind wing a little narrower than in *goron*.

Tergite 1 distinctly narrowed behind, dull, evenly rugose and without smooth, medial trough. Hairs of the ovipositor sheath not upstanding.

Length: ca. 3.8 mm. without ovipositor.

PAKISTAN: Punjab, Multan, Ghazighat, iii.1929, 4 ♀♀, one the *TYPE*, 1 ♂, bred from branches of *Tamarix dioica*, (*R. N. Malthur*).

Type in the British Museum (Nat. Hist.).

This large species is somewhat aberrant on the shape of the head. This, together with the reduced areolation of the propodeum, provide the two most essential features for its recognition.

Apanteles leptoura Cameron

Apanteles leptoura Cameron, 1909: 43.

Apanteles leptoura Cameron; Wilkinson, 1928a: 117.

♀. Hind femur infuscate but sometimes flushed with paler colouring towards base; hind tibia reddish yellow, tipped with infuscation on apical quarter.

Frons above, vertex and temples dull, rather coarsely punctate to rugose-punctate. Face dull, closely, rather coarsely punctate. Antenna a little shorter than the body, rather weak for the size of the insect; segment 17 about one and one third times longer than wide.

Punctation of the mesoscutum sharp, distinct; punctures along the course of the notaulices larger and more crowded than elsewhere; although the punctures at the posterior end of the notaulices are arranged in rows, the longitudinal element here is not well marked. Disc of scutellum polished and rather strongly narrowed behind. Propodeum with much reduced areolation, the areola very poorly defined; the upper part of the propodeum is dull, closely and densely rugose and its pubescence much shorter and less conspicuous than in *telon*. Costella and mediella of the hind wing far apart; the hind wing as broad as in *goron* and slightly broader than in *telon* (Text-fig. 76). Hind coxa, especially above, dull, considerably roughened and with some punctation.

Basal tergites (Text-fig. 72).

Ovipositor sheath about one and one quarter times longer than the hind tibia; ovipositor rather strongly curved. Setae of tergites 4-6 reduced more or less to a single row.

Length: ca. 3.6 mm. without ovipositor.

CEYLON: (type locality). MALAYA: Selangor, Kepong, i.vi.1947 2 ♀♀; Selangor, Setapak, 8.x.1947, 1 ♀; Perak, 14.x.1948, 2 ♀♀, 1 ♂.

Type in the British Museum (Nat. Hist.).

Host: Type recorded from *Tortrix* larva in stems of dadap.

Besides being related to *telon*, this species is also very closely related to *goron*, differing from it mainly in having the disc of the scutellum polished and the areolation of the propodeum reduced.

Apanteles goron sp. n.

♀. The relationship of this species with *leptoura* has been touched on above.

Shape of head as in *leptoura* but the punctuation of the face coarser.

Punctuation of the mesoscutum coarser, altogether less discrete. Disc of scutellum covered with pits and depressions and becoming almost rugose-striate towards. Fore wing (Text-fig. 68); hind wing broad as in *leptoura* but the costella and the mediella closer together (Text-fig. 68). Costula of propodeum distinct.

Ovipositor sheath slightly shorter. Setae of the upper surface of tergites 4-6 much more widely distributed.

MALAYA: Kuala Lumpur, 6.xii.1923, 3 ♀♀, one the TYPE, 1 ♂, bred from *Sylepta derogata*, (G. H. Corbett).

Type in the British Museum (Nat. Hist.).

Host: *Sylepta derogata* F. (Pyraustidae).

The three large species *goron*, *leptoura* and *telon*, seem to form a closely knit complex, largely characterized by the glass-clear wings, pellucid stigma and, by comparison with the somewhat ill assorted species of the *metellus*-complex, a rather strongly transverse head and the upper part of the propodeum dull and densely rugose. A reduced or weakened propodeal areolation seems also to be a feature of the complex. Nevertheless, the characters that bind these three species together are subtle and not easily expressed on paper.

Apanteles erse sp. n.

♀. A species with dark brown stigma. Hind femur entirely infusate; hind tibia becoming darkened distal to middle.

Head almost as transverse as in *telon*. Eyes not convergent but large and close together on the face (Text-fig. 71). Face shiny and with only superficial punctuation. Antenna almost as long as the body, rather thick, the preapical segment about one and one third times longer than wide.

Sculpture of the mesoscutum like that of *telon*. Propodeum with strong areolation, its general surface shiny and smooth-looking. First abscissa of the radius very obliquely placed on the stigma; stigma decidedly broad; hind wing broad but not quite so broad as in *goron* (cf. Text-fig. 68).

Tergite 1 (Text-fig. 69); its horizontal surface shows an ill defined longitudinal trough. Hairs of the ovipositor sheath rather long; ovipositor sheath hardly one and one quarter times longer than the hind tibia.

Length: ca. 3.5 mm. without ovipositor.

JAVA: Buitenzorg, x.1932, 11 ♀♀, one the TYPE, 13 ♂♂ (these males have pellucid stigma) bred from *Nacoleia octasema* (now *Lamprosema*), (T. H. C. Taylor). N. BORNEO: Jesselton, 3.vi.1959, 1 ♀, 1 ♂, ex *N. octasema*, (C. K. Shang). W. TIMOR: Soba, xi.1959, 1 ♀, ex *N. octasema*, (R. W. Paine).

Type in the British Museum (Nat. Hist.).

Host : *Lamprosema octasema* Meyrick (Pyraustidae).

A very distinctive species on the shape and general appearance of the first tergite. Possibly an aberrant member of the *metellus*-complex, from which complex it could be excluded only on the shape of the first tergite.

Apanteles medon sp. n.

♀. A species characterized by the weakly transverse median field of tergite (2 + 3). In general facies and in regard to the shape of the first tergite, *medon* is much like *erse* with which it may be compared as follows:—

Hind tibia yellow like the hind femur but tipped with infuscation.

Head considerably less transverse than in *erse* and the eyes smaller. Face somewhat dull, rather strongly and irregularly punctate.

Mesoscutum dull, with an even, coarse punctation, almost rugose-punctation that leaves the course of the notaulices unemphasised. Propodeum less sharply areolated; anterior dorsal areas dull, rugose and more pubescent. Stigma narrower, the 1st abscissa of the radius longer in proportion to the transverse cubitus (Text-fig. 73). Mesopleurum with a more extensive, duller and more discrete punctation. Inner spur of the hind tibia longer and stronger than in *erse*.

Ovipositor sheath slightly shorter but still a little longer than the hind tibia.

MALAYA : Serdang, 6.v.1930, 1 ♀, the TYPE, (N. C. Miller).

Type in the British Museum (Nat. Hist.).

A most distinct species, characterized by the shape of the basal tergites of the gaster, combined with the broad hind wings and coarse sculpture of mesoscutum.

Apanteles dictys sp. n.

♀. Another species with weakly transverse median field of tergite (2 + 3) and long 1st abscissa of the radius but much more distinctive than either *erse* or *medon*. It may be compared with these species as follows:—

Wings glass-clear with colourless setae and pellucid stigma.

Head rather small, its upper surface coarsely and characteristically rugose-punctate. Face coarsely rugose-punctate, slightly more so than in *medon*. Antenna about three quarters as long as the body, rather thin and with the preapical segment nearly one and a half times longer than wide.

Mesoscutum duller than in *erse* but its punctation still sharp and distinct with the course of the notaulices indicated by a band of coarser rugose-punctation; the mesoscutal sculpture is very different in general appearance from that of *medon*. Disc of scutellum more shiny than in *medon*, its punctures restricted more to the sides of the sclerite. Propodeum with complete areolation but the dorsal areas much less transverse than in *medon* and slightly less transverse and more rugose than in *erse*. Hind wing less narrow than in both *erse* and *medon*.

Tergite 1 very narrow but not narrowed behind (Text-fig. 80). Ovipositor sheath longer than in either *erse* or *medon*, about twice as long as the hind tibia.

Length: ca. 4 mm. without ovipositor.

JAVA : Buitenzorg, ii.1937, 1 ♀, the TYPE, 1 ♂, iv.1937, 2 ♀♀, (*Tjo Tjien Mo*); Tjipetir, x.1936, 1 ♀, 1 ♂, (*J. V. D. Vecht*).

Type in the British Museum (Nat. Hist.).

Host : *Maruca amboinalis* Felder (Pyrilidae).

An extremely distinctive species. I know of no other with which it could be confused.

***Apanteles agamedes* sp. n.**

♀. Hind tarsus dark brown with the basal segment white at base.

Eyes virtually not convergent. Face with a fine but quite distinct punctation. Antenna almost as long as the body, rather thin and with the preapical segment fully one and one third times longer than wide. Vertex between the posterior ocellus and the eye-margin faintly dull and with fine punctation.

Mesoscutum dull rather than shiny, its punctation very sharply discrete ; at posterior end of notaulic course, the punctures become larger but there is virtually no trace of longitudinal elements. Stigma pallid on nearly basal half ; hind wing (Text-fig. 19).

Tergite 1 densely rugose all over and without trace of a longitudinal furrow on its horizontal part. Median field of tergite (2 + 3) as strongly rugose as tergite 1 ; tergite (2 + 3) beyond the median field with a pale spot at each anterior corner. Ovipositor sheath about one and a third times longer than the hind tibia, clothed only with very short hairs.

Length: 3 mm. without ovipositor.

MAURITIUS : iii.1951, 2 ♀♀, one the *TYPE*, bred from *Phycita* sp. on *Lantana*, (*S. Felix*) ; Reduit, 20.xi.1944, 1 ♀, labelled "ex Carot", (*A. Moutia*).

Type in the British Museum (Nat. Hist.).

Host : *Phycita* sp. (Pyralidae).

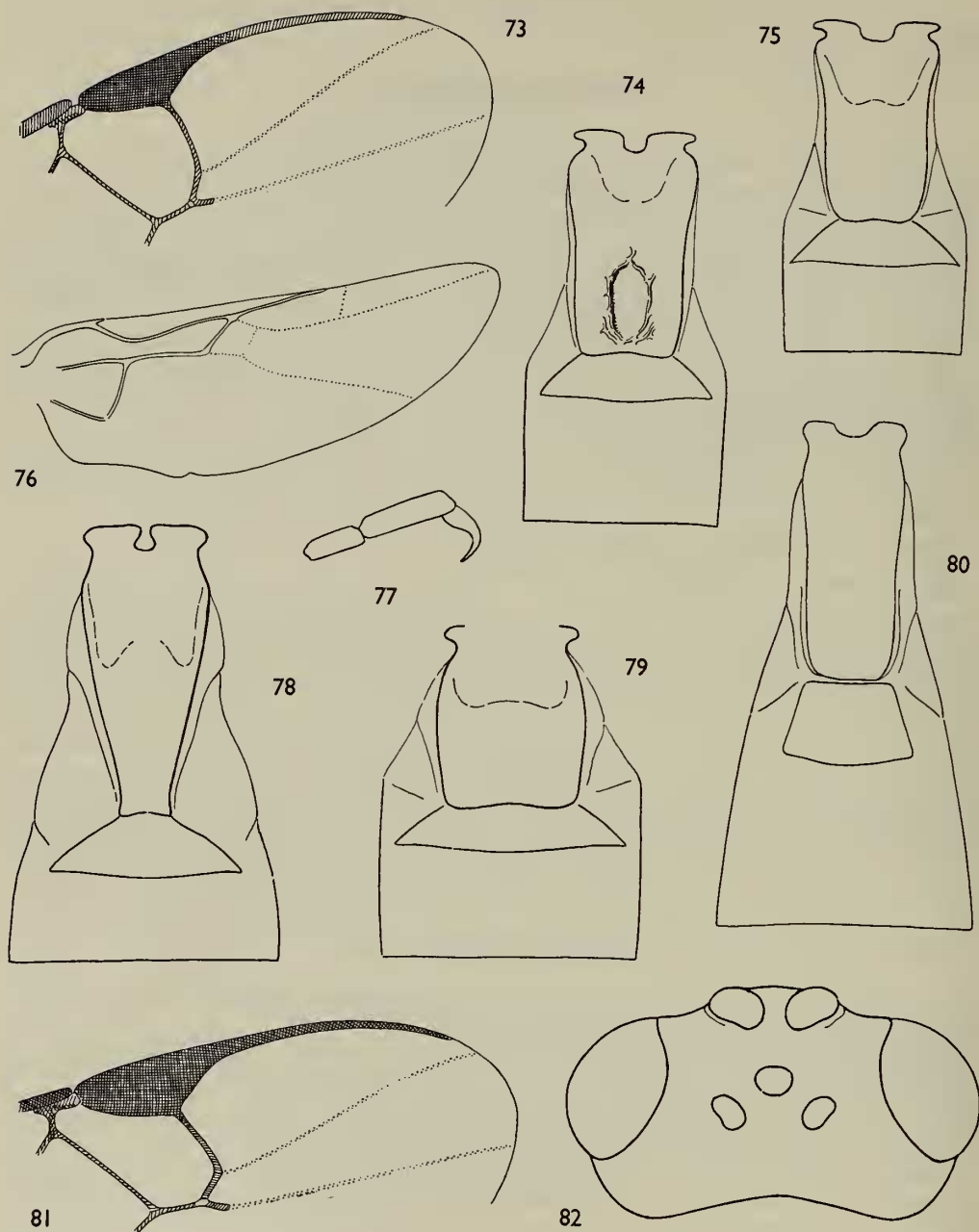
On account of the fringed vannal lobe, the shape and sculpture of the first tergite and the subtle nature of the mesoscutal punctation, this species must be regarded as aberrant within the *ater*-group s.l. and in many respects has more in common, perhaps, with certain members of the *ultor*-group, as represented by a number of species known to me from S. Africa and so far undescribed. The species of the *ultor*-group, however, all tend to have the postero-lateral areas of the propodeum decidedly transverse whereas in *agamedes* these areas are as long as wide. The edge of the vannal lobe in *agamedes* is quite straight beyond its widest part ; in the *ultor*-group, this edge tends to be evenly convex and the cubitellian cell is longer.

***Apanteles vacillans* sp. n.**

♀. Hind femur reddish with an extremely faint trace of apical infuscation ; hind tibia reddish yellow tipped with infuscation ; hind tarsus infusate throughout.

Eyes large, not convergent but close together on the face, much as in *erse*, (cf. Text-fig. 71). Head from above (Text-fig. 82). Distance between posterior ocellus and eye-margin less than twice the longer diameter of the ocellus. Face shiny, weakly punctate. Vertex between ocelli and eye-margin shiny and with only faint trace of punctation. Antenna about as long as the body, thick and with the preapical segment about one and a quarter times longer than wide.

Mesoscutum characteristically sculptured, highly polished along the middle with the punctures fading out ; on posterior half of middle lobe the smooth area becomes more extensive ; posterior end of notaulic course marked by a zone of striate-punctation. Disc of scutellum highly polished and strongly narrowed behind. Propodeum rather short but completely, strongly areolated, its various fields shiny and smooth-looking. Metacarp very long, almost closing the radial cell (Text-fig. 81) ; 1st abscissa of the radius very obliquely placed on the evenly dark brown stigma. Hind femur rather thick ; spines along upper edge of hind tibiae very numerous, close.



FIGS. 73-82. *Apanteles*, ♀: 73, *medon* sp. n., fore wing, part; 74, *salutifer* Wilkinson, basal tergites; 75, *diocles* sp. n., same; 76, *leptoura* Cameron, hind wing; 77, *vacillans* sp. n., hind claw; 78, *dissimile* sp. n., basal tergites; 79, *chloris* sp. n., same; 80, *dictys* sp. n., same; 81, *vacillans* sp. n., fore wing, part; 82, *vacillans* sp. n., head, from above.

Tergite 1 strongly narrowed behind, but not so much as in the two following species (cf. Text-fig. 72). Median field of tergite (2 + 3) angled laterally at about 45 degrees. Ovipositor sheath hardly one and a quarter times longer than the hind tibia, its sheaths clothed with long up-standing hairs.

Length: ca. 3.5 mm. without ovipositor.

PHILIPPINES : Luzon, Mt. Makiling, 1 ♀, the *TYPE*, (*Baker*).

Type in the U.S. National Museum.

This is a heavily built species, characterized essentially by the fading out medially of the mesoscutal sculpture.

Apanteles cestius sp. n.

♀. May be compared with *vacillans* as follows:—

Hind coxa becoming yellow on distal half ; hind tarsus only weakly infusate.

Distance between the posterior ocellus and the eye-margin only very slightly greater than the longer diameter of the ocellus, the eye slightly nearer to the ocellus than in *vacillans*. Face virtually without trace of punctation. Head less transverse (cf. Text-fig. 82). Antenna very long and powerful, longer than the body with segment 16 about twice as long as wide.

Mesoscutum decidedly dull by comparison with *vacillans* ; posterior end of notaulic course somewhat depressed with the punctures large here but without trace of longitudinal elements. Propodeum slightly longer, very strongly areolated ; the areola itself deeply hollowed out and almost polished. First abscissa of the radius almost at right angles to the stigma ; hind wing narrow ; as in *vacillans*, the metacarp is extremely long and almost closes the radial cell. Spines along upper edge of hind tibia finer and sparser ; hind femur less thick. Mesopleurum in front with a closer, finer punctation.

Length: ca. 3.5 mm. without ovipositor.

PHILIPPINES : Luzon, Mt. Makiling, 1 ♀, the *TYPE*, (*Baker*).

Type in the U.S. National Museum.

This species is abundantly distinct from *vacillans* on the sculpture of the mesoscutum. Specifically it is distinct on the length of the antenna. I regard it as transitional between the *ater*-group s.l. and the much smaller *taeniaticornis*-group, also dealt with in this paper.

Apanteles dissimile sp. n.

♀. Differs from *cestius* as follows:—

The hind coxa is entirely dark but the colour of the legs is otherwise similar in the two species.

Face completely smooth except for a faint satin-like sheen. Antenna shorter with segment 16 only about one and a third times longer than wide.

Sculpture of mesoscutum much more typical of the *ater*-group s.l. ; at the posterior end of the notaulic course, the punctures are arranged in such a way as to form a small zone of distinct striate-punctation.

Tergite 1 more narrowed behind (Text-fig. 78).

PHILIPPINES : Mindanao, Davao, 1 ♀, the *TYPE*, (*Baker*).

Type in the U.S. National Museum.

In the form of the first tergite of the gaster, this species is even more transitional towards the *taeniaticornis*-group than *cestius*.

Apanteles rugiceps Wilkinson

Apanteles rugiceps Wilkinson, 1934a : 148.

♀. Legs, excluding the coxae, bright reddish yellow.

Face strongly, very distinctly punctate. Frons above, vertex and temples strongly, coarsely rugose-punctate. Occipital region highly polished. Antenna about as long as the body with the preapical segment about one and third times longer than wide.

Disc of scutellum polished, smooth, except for a few punctures along sides. Propodeum with much reduced areolation ; no trace of a costula but there is a short, oblique keel behind the spiracle. Segment 4 of the hind tarsus not noticeably shorter than segment 5. Hind wing rather narrow ; metacarp hardly five times as long as its distance from the apex of the radial cell.

Tergite 1 markedly narrowed apically, smooth-looking but dull with vague rugulosity and scattered punctures. Ovipositor sheath about one and a quarter times longer than the hind tibia, markedly falcate at apex as is also the thin ovipositor ; the sheaths of the ovipositor are clothed with extremely short, more or less adpressed hairs.

Length: ca. 2.8 mm. without ovipositor.

INDIA : Assam.

Type in the British Museum (Nat. Hist.).

This species seems to be characterized by the strongly sculptured head in combination with the bright yellow legs. Otherwise there is nothing particularly distinctive about it.

Apanteles cocotis Wilkinson

Apanteles cocotis Wilkinson, 1934a : 152.

♀. Hind femur reddish yellow ; hind tibia reddish yellow, with faint infuscation at tip.

Face shiny, virtually smooth. Top of head, including temples, very shiny, almost smooth. The highly polished occipital region reaches as far as the ocelli. Antenna about as long as the body, with the preapical segment one and one third times longer than wide.

Mesoscutum shiny, its punctuation, on the whole, fine. Areolation of the propodeum not strong ; costula weak and in some specimens more or less absent. Median cell of the fore wing densely pubescent all over ; metacarp very long, fully seven times as long as its distance from the apex of the radial cell ; abscissa 1 of the radius somewhat obliquely placed on the stigma and a well marked angle between it and the transverse cubitus. Basal tergites (Text-fig. 44).

Ovipositor rather thick.

Length: ca. 2.3 mm. without ovipositor.

JAVA : Buitenzorg.

Type in the British Museum (Nat. Hist.).

Host : Said to have been bred from male coconut flowers.

A distinctive species on the combination of dark wings and densely spinose hind tibia. Related to the species of the *taragamae*-complex, though differing widely from most of these on wing characters.

Apanteles dotus sp. n.

♀. A species related to *rugiceps* and intermediate between this species and *cocotis*. May be compared with *rugiceps* as follows:—

Hind femur entirely infusate ; hind tibia becoming paler on basal third. Wings faintly brownish.

Head narrower in proportion to the width of the thorax. Top of head rugose-punctate. Towards the occipital region, which shows a dull satin-like sheen, the sculpture of the vertex and temples becomes sharp, discrete punctation and the appearance of the head here is very characteristic. Face less sharply and less discretely punctate, its surface with an obvious satin-like sheen.

Mesoscutum less coarsely punctate but much more so than in *cocotis*. Disc of scutellum much more distinctly punctate. Setae of the median cell slightly denser; metacarp longer, fully seven times as long as its distance from the apex of the radial cell, as long as in *cocotis*. Propodeum lacking the short keel behind the spiracle; the surface is highly polished on each side of the areola.

Ovipositor sheath not falcate at apex; ovipositor thicker but not quite so thick nor so much curved as in *cocotis*.

CEYLON: Talawakelle, 1933, 3 ♀♀, one the TYPE, ex *Homona coffearia*, 1 ♂, (*C. B. R. King*). PHILIPPINES: Luzon, Mt. Makiling, 1 ♀, (*Baker*).

Type in the British Museum (Nat. Hist.).

Host: *Homona coffearia* Nietner (Tortricidae).

This species, together with *rugiceps* and *cocotis*, are very similar in appearance though all are easily separable. The appearance of the back of the head is very characteristic in *dotus*. This species and *rugiceps* have the concavity of the vannal lobe deeper than in *cocotis*.

Apanteles aristaeus sp. n.

♀. A thick-set, heavily built species with the hind femur entirely blackish; hind tibia deep reddish yellow with the apical third infusate.

Head markedly narrower than the thorax. Face very strongly, sharply punctate. Frons above, vertex and temples strongly thimble-punctate; around the edge of the highly polished occiput the punctures become very sharply discrete. Antenna a little shorter than the body, thin, rather weak, with the preapical segment about one and a half times longer than wide.

Scutellar disc highly polished, wide behind and here slightly flattened. Propodeum sharply areolated but rather short with its postero-lateral areas distinctly transverse. Mesopleurum sculptured all over its median convex part, the sculpture changing to fine aciculation within the posterior depression. Wings hyaline; the hind pair rather broad; abscissa 1 of the radius almost twice as long as the transverse cubitus and forming a feeble curve with it (as in species of *goron*-complex). Hind coxa strongly rugose-punctate on outer face above.

Tergite 1 very short, subquadrate, its horizontal surface smooth-looking and almost without sculpture.

♂. Has the stigma extensively pale medially but is sculptured like the female.

Length: ca. 3 mm. without ovipositor.

INDIA: Bangalore, 25.iii.1960, 1 ♀, the TYPE, ex ? *Cydia leucostoma* on tea; Assam, v.1959, 1 ♀, ex *C. leucostoma* on tea; Tocklai Exp. Station, 1957, 1 ♀, ex *C. leucostoma* on tea, (*G. M. Das*). JAVA: Wonosari Est., 7 ♀♀, 7 ♂♂, bred viii.1937 from *Laspeyresia leucostoma*. This series from Java is made up of smaller individuals than those from India, the females, without ovipositor, being about 2.7 mm. in length.

Type in the British Museum (Nat. Hist.).

Host: *Cydia leucostoma* Meyrick (Olethreutidae), a pest of tea.

A most distinctive species, easily recognised by the shape of the first gastral tergite in combination with the small, characteristically sculptured head.

Apanteles ippeus sp. n.

♀. A dark-legged species with the hind tibia pale only on basal third and the hind tarsus blackened throughout. Wings hyaline with the stigma evenly brown and the setae of the median cell rather sparse and colourless.

Face shining and with only the merest trace of punctation. Frons above and vertex between ocellus and eye-margin shining, smooth. Temples rugose and contrasting sharply with the highly polished occipital region. Posterior ocelli far apart, the distance between them greater than that between one of them and the eye-margin, 10 : 7. Antenna a little shorter than the body with the preapical segment about one and third times longer than wide.

Disc of scutellum polished and with faint trace of punctation. Areolation of propodeum completely wanting, the areola hardly indicated and no trace of a costula ; general surface of propodeum shiny, weakly rugose. Hind tarsus slender.

Tergite 1 (Text-fig. 90), its horizontal surface with a satin-like sheen and with feeble rugosity. Ovipositor sheath about three quarters as long as the hind tibia, clothed with long upstanding hairs.

Length: ca. 2.2 mm. without ovipositor.

AUSTRALIA : Canberra, 10 ♀♀, one the *TYPE*, 7 ♂♂, bred from *Plutella maculipennis*, (F. Wilson).

Type in the British Museum (Nat. Hist.).

Host : *Plutella maculipennis* Curtis (Hyponomeutidae).

Very distinct on the shortness of the metacarp. Needs to be compared with the species of the *eublemmae*-subgroup in which an equally short metacarp often occurs.

Apanteles assis sp. n.

♀. Hind femur deeply infusate ; hind tibia infusate but becoming reddish yellow on basal third. Wings very faintly brownish.

Face very distinctly punctate, but the punctures, though large, not sharp. Top of head somewhat dull, the vertex between the posterior ocellus and the eye-margin with distinct rugose-punctation. Antenna as long as the body ; rather thick and with the preapical segment one and a third times longer than wide.

Mesoscutum dull, its punctation coarse and heavy ; at posterior end of notaulic course, the sculpture becomes coarse rugose-reticulation but without longitudinal elements. Disc of scutellum with coarse punctation along sides. Propodeum with complete areolation. Metacarp about four and a half times longer than its distance from the apex of the radial cell.

Ovipositor sheath slightly longer than the hind tibia ; ovipositor moderately thick.

Length: ca. 2.8 mm. without ovipositor.

PHILIPPINES : Island of Basilan, 1 ♀, the *TYPE*, (Baker).

Type in the U.S. National Museum.

Perhaps fairly closely related to such species as *rugiceps* and *dotus* but differing from both of these in having the propodeum fully areolated. Not a sharply characterized species but its most significant feature seems to be the strong, dull sculpture of the mesoscutum.

Apanteles galatea sp. n.

♀. A small, very dark-legged species largely characterized by an ovipositor sheath that is about one and half times longer than the hind tibia and an ovipositor that is thin and downcurved at apex.

Face polished, smooth. Frons above and vertex between the posterior ocellus and the eye-margin polished and smooth. Antenna fully as long as the body with the preapical segment fully one and a quarter times longer than wide.

Disc of scutellum somewhat flattened, polished but with a trace of punctation around sides. Propodeum with its areolation much reduced ; no costula or keel behind the spiracle.

Tergite 1 strongly narrowed behind. Hairs of tergites 4-6 at least on dorsal surface reduced more or less to a single row.

Length: 2 mm., without ovipositor.

PHILIPPINES : Mindañao, Dapitan, 1 ♀, the TYPE, (Baker).

Type in the U.S. National Museum.

Apanteles solox sp. n.

♀. A species essentially characterized by the long, hind tarsus (Text-fig. 88). Although it is coupled with *ariovistus* in the key, *solox* is actually more closely related to *dotus* and allied species.

Hind femur infusate throughout and the hind tibia pale only at extreme base ; hind tarsus more or less evenly infusate throughout.

Face shiny and virtually impunctate (cf. *rugiceps* and *dotus*). Vertex between the posterior ocellus and the eye-margin faintly dull and with a trace of obsolescent rugose-punctation. Antenna about as long as the body with preapical segment about one and a quarter times longer than wide.

General surface of mesoscutum very shiny ; punctation, especially along the middle lobe, somewhat superficial. Disc of scutellum highly polished. Areolation of propodeum greatly reduced ; neither costula nor keel behind the spiracle present. Outer side of the hind tibia particularly strongly spinose, the thicker spines much more numerous and more erect than in *dotus*. Metacarp not extending quite so close to the apex of the radial cell as in *dotus*.

Tergite 1 much as in *dotus* and *rugiceps*. Hairs of tergites 4-5 tending to be reduced to a single row at least on the dorsal surface of the tergites. Ovipositor very thin.

Length: 2.5 mm. without ovipositor.

MALAYA : Singapore, 1 ♀, the TYPE, (Baker).

Type in the U.S. National Museum.

This species differs from *rugiceps*, *dotus* and *cocolis* in having a longer ovipositor. There are numerous other differences.

Apanteles ariovistus sp. n.

♀. This species lacks the typical facies of the majority of the species of the *taragamae*-complex and is largely characterized by the possession of a somewhat large head.

Hind femur infusate throughout ; hind tibia becoming obscurely paler on about apical third. Wings very faintly brownish.

Face shining and virtually impunctate. Vertex between posterior ocellus and eye-margin almost polished.

Mesoscutum very shiny, the punctation along the middle line of each lobe tending to fade out. Suture between mesoscutum and disc of scutellum shallow, foveate rather than costate. Disc of scutellum highly polished. Areolation of propodeum much reduced ; no differentiated costula present. Hind wing rather narrow.

Tergite 1 strongly rugose. Ovipositor sheath about one and one third times longer than the hind tibia.

Length: ca. 3 mm. without ovipositor.

SUMATRA : Fort de Kock, 920m., 1924, 1 ♀, the *TYPE*, (*Jacobson*).

Type in the British Museum (Nat. Hist.).

The essential characters of this species are the thick antenna and the large head. The appearance of the meso-scutellar furrow is also rather characteristic but its value could be better appreciated if more specimens were available.

Apanteles prosymna sp. n.

♀. A small dark-legged species essentially characterized by the abrupt apical narrowing of tergite 1 with its horizontal surface, in consequence, being wider than long.

Hind legs obscure reddish brown with the hind tibia becoming paler on basal half. Stigma evenly brown.

Frons above, temples, and vertex, dull, rugulose. Face dull, faintly rugose. Antenna slightly shorter than the body, with the preapical segment about one and a third times longer than wide.

Mesoscutum shiny but with a satin-like sheen ; its punctuation fine ; posterior end of notaulic course with a large zone of striate-punctuation. Disc of scutellum polished and without sculpture.

Tergite 1 and median field of tergite (2 + 3), (Text-fig. 87).

Length: ca. 2 mm.

MALAYA : Kuala Lumpur, 15.v.1939, 15 ♀♀, one the *TYPE*, 1 ♂, bred from *Lycaenesthes emolus*.

Type in the British Museum (Nat. Hist.).

Host : *Lycaenesthes emolus* Godart (Lycaenidae).

Apanteles javensis Rohwer

Apanteles javensis Rohwer, 1918 : 567.

Apanteles javensis Rohwer ; Wilkinson, 1928a : 113.

♀. This species is closely related to *prosymna* and the main differences have been given in the key. There is little to add.

Tergite 1 is considerably narrower and its horizontal surface, in consequence, is less transverse (Text-fig. 89). The basal part of the hypopygium (hard to see!) shows fine, *transverse* aciculation.

JAVA : Buitenzorg (type locality). SIAM. CEYLON.

Type in the U.S. National Museum.

Host : *Parnara conjuncta* Herrich-Schäffer, *Parnara mathias* F. (Hesperiidae).

A series from Ceylon and another from Siam (Bangkok) differ from the two paratypes in the British Museum and the females referred to by Wilkinson in a number of small details that I am unable to evaluate on the total material available. In these two series, the females have the ocelli slightly further apart, the sculpture of the mesoscutum reduced so that the surface is strongly shining and almost smooth and the hind wing slightly narrower. These differences, however, may be correlated with a reduction in size, the females being about 1.8 mm. while the paratypes are about 2.2 mm.

Apanteles folia sp. n.

♀. A species far removed from *javensis* and *prosymna* on the shape of the first tergite.

Hind tibia reddish yellow, becoming infusate on apical third in the type but the apical infuscation feebler and restricted to distal quarter in two females from China (Canton).

Top of head dull, strongly rugose. Face coarsely punctate, becoming duller and rugose-punctate towards antennal insertions. Antenna a little shorter than the body (broken in type), rather weak and with the preapical segment about one and quarter times longer than wide.

Mesopleurum strongly, coarsely punctate all over its median part, the sculpture extending into the depressed posterior part and here becoming vague striation. Metacarp rather short, about three times as long as its distance from the apex of the radial cell. Propodeum strongly areolated; the dorsal areas are dull, rugose and contrast sharply with the strongly shining, almost smooth, posterior fields. Hind coxa dull, considerably rugose on outer, upper face.

Horizontal part of tergite 1 about as long as wide, strongly rugose. Ovipositor sheath as long as the first segment of the hind tarsus.

Length: ca. 3 mm.

MALAYA: Ulu Sali Road, 24.xii.1924, 1 ♀, the TYPE, bred from *Spindasis lohita*. CHINA, Canton, 2 ♀♀, 1 ♂, (*Hoffman*). PHILIPPINES: Island of Basilan, 1 ♀, (*Baker*); Luzon, Mt. Makiling, 1 ♀, (hind tarsus entirely bright reddish yellow), (*Baker*).

Type in the British Museum (Nat. Hist.).

Host: *Spindasis lohita* Horsfield (Lycaenidae).

Apanteles folia sp.n., form or subspecies.

Specimens differing strikingly from the nominate form in having the stigma entirely dark brown and reduced propodeal areolation. On the material available I am not inclined to regard these differences as having specific value.

AUSTRALIA: National Park, iv.1927, 2 ♀♀, 1 ♂, bred from Lycaenid pupae, (*M. Fuller*); Queensland, Eidsvold, 1 ♀, 2 ♂♂, bred from *Jalmenus evagoras eubulus* Miskin (Lycaenidae).

Intermediate between this form of doubtful status and the nominate form is a single female from NEW GUINEA; Markham Valley, 28.viii.1926, bred from *Luthrodes cleotas kaiphos* Fruhstorfer, (*J. H. Ardly*). This female has the stigma colourless in the middle with a wide, brown border; the propodeum is exactly as in the Australian specimens.

The Australian males have the stigma as dark as in the females.

Considered as an aggregate, *folia* is a distinctive species and need not be confused with any other species dealt with in this revision.

Apanteles demades sp. n.

♀. This species is certainly related to *folia* but is much smaller, being about 2 mm. in length. It may be compared with *folia* as follows:—

Face smoother, more shiny. Top of head more finely sculptured.

Mesoscutum more finely punctate. Disc of scutellum slightly more convex, more shiny and with hardly a trace of punctation. 1st abscissa of the discoideus angled at its junction with the nervulus. Areolation of the propodeum slightly less sharp. Hind coxa almost polished on outer surface.

Tergite 1 slightly narrowed behind.

MALAYA : Kuala Lumpur, 17.v.1953, 1 ♀, the *TYPE*, 1 ♂, bred from *Selepa celtis*. Type in the British Museum (Nat. Hist.).

Host : *Selepa celtis* Moore (Noctuidae).

I introduce this species as new with some misgivings because, apart from the small venation difference, all the differences between *demades* and *folia* could possibly be associated with the difference in size. Only further material will solve the problem.

Apanteles crates sp. n.

♀. This species differs at once from *folia* and *demades* in having a much longer metacarp, this being fully six times as long as its distance from the apex of the radial cell.

Hind femur and hind tarsus infuscate throughout ; hind tibia becoming yellowish on basal half.

Vertex between the ocelli and the eye-margin shining, almost smooth. Face shiny, very faintly roughened. Antenna fully as long as the body with the preapical segment about one and half times as long as wide.

Mesoscutum somewhat dull. Disc of scutellum with a trace of punctation towards sides. Areolation of the propodeum complete.

Tergite 1 and the median field of tergite (2 + 3), (Text-fig. 86).

Length: ca. 2.2 mm.

PHILIPPINES : Luzon, Mt. Makiling, 1 ♀, the *TYPE*, (*Baker*).

Type in the U.S. National Museum.

This little species is largely characterized by the shape of the median field of tergite (2 + 3), a feature that at once separates it from the following species—*sartamus*.

Apanteles sartamus sp. n.

♀. The differences between this species and *crates* have already been covered in the key and there is little to add.

The hind tibia is more extensively infuscate, only the basal quarter showing pale colouring. Head slightly less transverse. Tergite 1 considerably more narrowed behind.

PHILIPPINES : Los Baños, 1 ♀, the *TYPE*, (*Baker*).

Type in the U.S. National Museum.

In the shape of the basal tergites, this species is transitional between *javensis* and its close ally *prosymna* on the one hand, and *folia* on the other.

Apanteles daimenes sp. n.

♀. Hind tibia becoming obscurely yellowish on basal half.

Face smooth, shining. Vertex between the posterior ocellus and the eye-margin shiny and almost smooth ; temples distinctly rugulose. Antenna as long as the body with the preapical segment about one and one third times longer than wide.

Hardly a trace of longitudinal elements at the posterior end of the notaulic course but the punctures here larger and closer. Disc of scutellum polished, smooth. Propodeum with almost complete areolation though the costula is not clearly defined. Hind spurs weak, the inner one not reaching beyond the middle of the basal segment of the hind tarsus ; hind tarsus rather short. Setae of the median cell long, rather sparse ; metacarp about four and a half times as long as its distance from the apex of the radial cell.

Tergite 1 short and only weakly narrowed behind. Ovipositor strongly curved and without an apical constriction.

Length: ca. 1.8 mm. without ovipositor.

FIJI Is : Koroninia, 20-21.xii.1951, 6 ♀♀, one the *TYPE*, 1 ♂, bred from larva on sweet potato, (*B. A. O'Connor*).

Type in the British Museum (Nat. Hist.).

This species is characterized by the relatively large size of the mesoscutal punctures and the shape of the ovipositor.

Apanteles scultena sp. n.

♀. At first sight like *daimenes* but at once distinguishable from that species on the shape of the ovipositor. It may be compared with *daimenes* as follows:—

Hind femur, hind tibia and hind tarsus entirely reddish yellow, though the hind femur is faintly darker than its tibia. Stigma almost colourless, pale straw-yellow.

Face distinctly but indefinitely punctate. Frons above and the vertex between the ocelli and the eye-margin dull, finely, evenly rugose. Antenna very distinctly shorter than the body with the preapical segment only about one and a quarter times longer than wide.

Mesoscutal punctation finer and denser; a distinct trace of longitudinal elements at the posterior end of the notaulic course. Propodeal areolation showing less definition; costula completely absent.

Hypopygium heavily sclerotised and without lateral creasing. Ovipositor (Text-fig. 83).

MALAYA : Clifford Road, 26.x.1939, 3 ♀♀, one the *TYPE*, 1 ♂.

Type in the British Museum (Nat. Hist.).

Apanteles painei sp. n.

♀. This species differs strikingly from both *daimenes* and *scultena* on the sculpture of the top of the head and of the mesoscutum. It may be compared with *daimenes* as follows:—

Hind tibia virtually black; only the extreme base faintly reddish. Stigma colourless with a darker border.

Vertex between the ocelli and the eye-margin as coarsely sculptured as the temples; whereas in *daimenes* the polished occipital region extends almost to the posterior ocelli, in this species there is a broad zone of dull, rugose sculpture behind the ocelli; this sculptured zone is sharply marked off from the polished occiput.

Posterior end of the notaulic courses with a large, duller area of coarser punctation; no longitudinal elements within this zone. Mesopleurum much more coarsely sculptured; a row of short, transverse costae extends downwards from beneath the wing insertions into the posterior oblique depression. Hind wing slightly broader. Costula of propodeum distinct throughout.

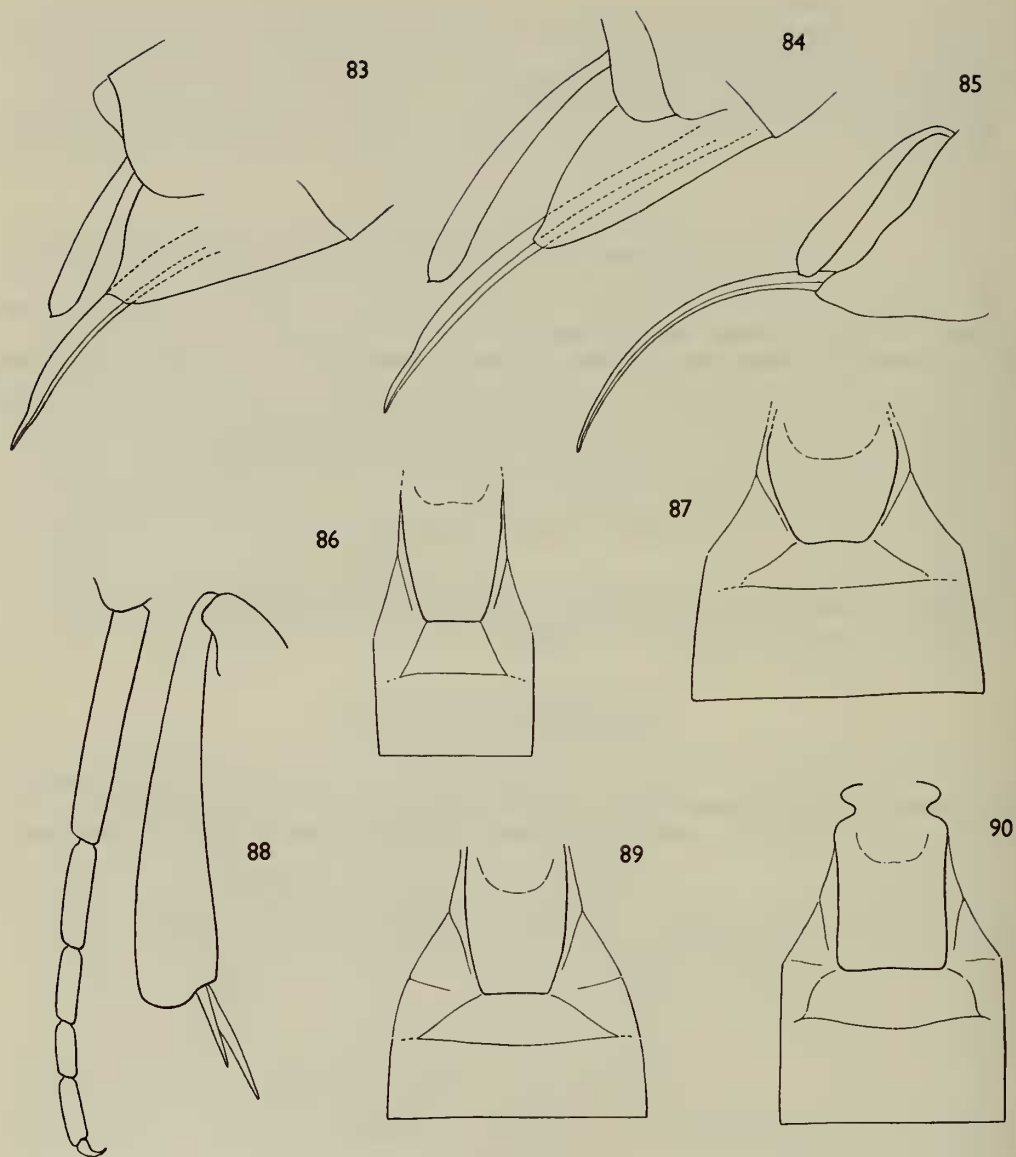
Setae of tergites (2 + 3)–6 restricted virtually to a single row; this tendency is much less noticeable in *daimenes* (Text-fig. 11). Ovipositor sheath slightly longer; ovipositor itself much as in *daimenes* but slightly thicker (cf. Text-fig. 85).

NEW GUINEA : Lae, 9 ♀♀, one the *TYPE*, 8 ♂♂, bred viii–x.1957, from *Agonoxena pyrogramma*, (*R. W. Paine*).

Type in the British Museum (Nat. Hist.).

Host : *Agonoxena pyrogramma* Meyrick (Agonoxenidae).

Differs from *scultena* on sculpture, leg colour and shape of ovipositor.



FIGS. 83-90. *Apanteles*, ♀: 83, *scultena* sp. n., ovipositor; 84, *stennos* sp. n., same; 85, *daimenes* sp. n., same; 86, *crates* sp. n., basal tergites; 87, *prosymna* sp. n., same; 88, *solox* sp. n., hind tibia and hind tarsus; 89, *javensis* Rohwer, basal tergites; 90, *ippeus* sp. n., same.

Apanteles despectus sp. n.

♀. Hind leg, including the tarsus, entirely blackish, except that the tibia is faintly paler at extreme base.

Face shiny, almost smooth. Vertex between the ocelli and the eye-margin almost smooth. Posterior ocelli rather wide apart, the distance between them fully equal to the distance between one of them and the eye-margin. Antenna as long as the body, very thin, with segment 13 much longer than 14 and the preapical segment about one and one third times longer than wide.

Mesoscutum somewhat dull, its punctation fine and not very distinct. A zone of duller sculpture marks the posterior end of the notaulic courses. Propodeum with no trace of a costula. Hind tarsus relatively long and thin.

Tergite 1 parallel-sided. Tergites thickly setose all over. Ovipositor sheath fully two thirds as long as the hind tibia; ovipositor rather thin, not strongly curved and in general appearance much as in *daimenes* (cf. Text-fig. 85).

Length: 2 mm. without ovipositor.

THAILAND: Bangkok, x.1958, 2 ♀♀, one the *TYPE*, 2 ♂♂, labelled "ex ground-nut leaf-miner".

Type in the British Museum (Nat. Hist.).

A species characterized by the very short metacarp in combination with the short ovipositor. The Australian *ippeus* has also a short metacarp and in many respects is fairly closely related to *despectus* but *ippeus* has the metacarp still shorter than in *despectus* and the ovipositor slightly longer, among other small differences.

Apanteles schneideri sp. n.

♀. Differs from *daimenes*, *painei*, *despectus* and *scutellena* in having tergite 1 strongly narrowed to apex and the ovipositor sheath about as long as the hind tibia.

Legs brownish with the hind tibia becoming yellowish on basal half.

Frons above, vertex and temples finely rugose, dull. Antenna shorter than the body with segment 17 about one and a third times longer than wide and segment 13 one and a half times longer than wide and only slightly longer than 14; pubescence of flagellum rather bristly.

Punctation of mesoscutum rather strong for the size of the insect; punctures larger at posterior end of notaulic course but the surface here without longitudinal elements. Disc of scutellum smooth. Propodeum without costula. Setae of the median cell not dense. Spines of the outer side of the hind tibia unusually sparse.

Ovipositor short, thick, rather abruptly narrowed apically but less than in *scutellena* (cf. Text-fig. 83); longer than in *scutellena*.

EAST SUMATRA: Asahan, 1934-36, 12 ♀♀, one the *TYPE*, bred from lepidopterous pest on Gambir, (*F. Schneider*).

Type in the British Museum (Nat. Hist.).

The absence of sculpture on tergite 1 should not be accepted as absolutely diagnostic for the recognition of this species; far more important is the shape of the ovipositor.

The *EUBLEMMAE*-subgroup

KEY TO SPECIES

FEMALES

- 1 Metacarp hardly one and a half times longer than its distance from the apex of the radial cell.
Head subtriangular, seen from in front ; mouth parts showing some degree of lengthening ; ovipositor sheath not longer than the hind tibia 2
- Metacarp at least about twice as long as its distance from the apex of the radial cell and then the ovipositor sheath is much longer than the hind tibia 6
- 2 Eyes strongly convergent below (Text-fig. 97) ; inner spur of the hind tibia fully half as long as the hind basitarsus ; disc of scutellum dull, strongly, closely punctate, except medially, its rugose posterior tip almost interrupting the posterior polished band of the scutellum *trabea* sp. n. (p. 107)
- Eyes not convergent below ; inner spur of the hind tibia distinctly less than half as long as the hind basitarsus ; disc of scutellum much less rugose 3
- 3 Setae of the 1st cubital cell very sparse, about twelve in number.
Stigma evenly brown ; antenna as long as, or almost as long as, the body 4
- Setae of the 1st cubital cell much more numerous than this.
Ovipositor sheath almost as long as the hind tibia 5
- 4 Ovipositor sheath hardly two thirds as long as the hind tibia ; antenna very thin, with the preapical segment about one and a half times longer than wide
rosaces sp. n. (p. 107)
- Ovipositor sheath fully as long as the hind tibia ; antenna distinctly a little thickened distally ; preapical segment hardly one and one third times longer than wide
arion sp. n. (p. 109)
- 5 Edge of vannal lobe beyond its widest part imperceptibly convex ; propodeum very shiny, almost polished ; mesoscutum weakly shining and with a very feeble sculpture but with a duller zone of rugosity at each posterior extremity of the notaulic course *eriphyes* sp. n. (p. 109)
- Edge of vannal lobe beyond its widest part straight ; propodeum finely rugose, its V-shaped areola more in evidence ; mesoscutum dull, almost coarsely rugose and with no emphasis along the course of the notaulices *patens* sp. n. (p. 110)
- 6 Face subrostriform ; ovipositor sheath about one and a half times longer than the hind tibia ; antenna very thin, with segment 14 fully twice as long as wide.
Metacarp about twice as long as its distance from the apex of the radial cell ; stigma evenly dark brown *camirus* sp. n. (p. 110)
- If the face shows any tendency to be rostriform or subtriangular, then the ovipositor sheath is much shorter and the antenna is neither so long nor so thin 7
- 7 Head from in front distinctly subtriangular ; mouth parts lengthened.
Setae of the median and submedian cells very sparse and widely absent along the medius side of the cells ; ovipositor sheath fully as long as the hind tibia 8
- Head from in front not subtriangular ; mouth parts not lengthened 13
- 8 Spines of the outer side of the hind tibia short, blunt, fire-red, very numerous, not upstanding ; segments 12-17 of the antenna not evenly cylindrical, being slightly swollen at apex on one side.
Antenna distinctly shorter than the body, with segment 17 about one and one third times longer than wide *nepe* sp. n. (p. 113)
- Spines of the outer side of the hind tibia neither so short nor so blunt, nor so numerous as this, being obviously pointed and upstanding ; segments 12-17 of the antenna evenly cylindrical even if very short 9
- 9 Eyes distinctly convergent below ; at least the 1st and 2nd abscissae of the dis-

- coideus darkened and pigmented ; inner spur of the hind tibia not quite reaching the middle of the hind basitarsus.
- Stigma evenly dark brown 10
- Eyes hardly convergent below and hence wider apart on the face ; 1st and 2nd abscissae of the discoideus not obviously darkened or pigmented ; inner spur of the hind tibia reaching middle of hind basitarsus and longer compared with the outer spur than above.
- Antenna shorter than the body, with the preapical segment about one and one quarter times longer than wide 12
- 10 Tergite 1 virtually parallel-sided.
- Antenna as long as the body, very thin, rather abruptly narrowed beyond segment 13 *dido* sp. n. (p. 112)
- Tergite 1 distinctly narrowed apically 11
- 11 Antenna shorter, the preapical segment hardly one and one third times longer than wide ; setae of the radial cell becoming noticeably sparser towards the stigma ; tergite 1 narrower only at extreme apex ; mesoscutum appearing slightly blacker because its sculpture is less obscured by pubescence *ione* sp. n. (p. 111)
- Antenna longer, the preapical segment about one and a half times longer than wide ; setae of the radial cell not becoming so noticeably sparser towards the stigma ; tergite 1 narrowed from where it turns over to apex and with a narrower, deeper trough on its horizontal part ; mesoscutum appearing less black owing to a finer, denser pubescence *triareus* sp. n. (p. 112)
- 12 Ovipositor sheath as long as the hind tibia and, seen from above, clothed with long, upstanding hairs ; tergite 1 almost coarsely rugose, not or hardly narrowed behind ; stigma dark, with or without a still darker border ; metacarp slightly longer *eupolis* sp. n. (p. 111)
- Ovipositor sheath longer than the hind tibia, about one and one third times longer and, seen from above, with short, not upstanding hairs ; tergite 1 only very weakly rugulose, distinctly narrowed behind ; stigma pallid with contrasting darker border ; metacarp slightly shorter *navius* sp. n. (p. 111)
- 13 Ovipositor sheath at most one and a half times longer than the hind tibia 14
- Ovipositor sheath almost twice as long as the hind tibia 29
- 14 Metacarp short, at most only slightly more than twice as long as its distance from the apex of the radial cell.
- Stigma colourless, with darker border ; ovipositor moderately thick 15
- Metacarp longer, at least three times as long as its distance from the apex of the radial cell 18
- 15 Mesopleurum pubescent all over, at most a very small bare zone in front of the middle coxa ; mesoscutum with a very characteristic dense, silvery, pubescence that, on posterior half of the mesoscutum, becomes longer and more silky.
- Eyes not convergent 16
- Mesopleurum with a large, oblique zone that is completely free from hairs ; pubescence of the mesoscutum shorter, of normal appearance 17
- 16 Tegula ivory-white ; ovipositor sheath as long as the hind tibia, not at all falcate apically *articas* sp. n. (p. 112)
- Tegula pale brown ; ovipositor sheath fully one and a quarter times longer than the hind tibia, markedly falcate apically *mutilia* sp. n. (p. 113)
- 17 Ovipositor sheath hardly as long as the hind tibia ; eyes distinctly convergent ; inner spur of the hind tibia rather weak, not reaching beyond the middle of the hind basitarsus *lycidas* sp. n. (p. 113)
- Ovipositor sheath distinctly longer than the hind tibia ; eyes virtually not convergent ; inner spur of the hind tibia stronger, reaching distinctly beyond the middle of the basitarsus. Philippines *upis* sp. n. (p. 117)

- 18 Stigma more or less pellucid, at most with a faintly darker border 19
 - Stigma evenly brownish all over 27
 19 Metacarp not longer than the stigma.
 Antenna very short ; 1st cubital cell very sparsely setose ; ovipositor without
 an apical constriction *nemesis* sp. n. (p. 114)
 - Metacarp distinctly longer than the stigma 20
 20 Ovipositor sheath not longer than the hind tibia 21
 - Ovipositor sheath distinctly longer than the hind tibia 24
 21 Antenna much shorter than the body, the four preapical segments virtually not longer
 than wide.
 Venation proximal to the areolet without trace of pigmentation ; ovipositor
 sheath about as long as the hind tibia ; ovipositor with abrupt apical constriction
 *nivellus* sp. n. (p. 115)
 - Antenna not so strikingly shorter than the body, the four preapical segments dis-
 tinctly longer than wide 22
 22 Lateral third of propodeum in far greater part without raised rugosities, the surface
 with dull microsculpture which has a satin-like sheen ; disc of scutellum, except
 narrowly along sides, smooth, shining ; at least the apical half of the hind tibia
 deeply infusate ; horizontal surface of tergite 1 typical of subgroup, smooth,
 with satin-like sheen 23
 - Lateral third of propodeum with numerous, raised rugosities, the surface very shiny
 and without a satin-like sheen ; disc of scutellum somewhat dull by reason of vague
 rugulosity, somewhat weaker medially ; hind tibia reddish-yellow with extreme
 tip faintly infusate ; horizontal surface of tergite 1 coarsely rugose
 *linus* sp. n. (p. 120)
 23 Ovipositor very thin, rather abruptly downcurved at apex (Text-fig. 105) ; hind tibia
 becoming markedly reddish-yellow proximal to middle *drupes* sp. n. (p. 115)
 - Ovipositor rather thick, evenly but weakly curved (Text-fig. 106) ; hind tibia black-
 ish, except at extreme base *eublemmae* sp. n. (p. 115)
 24 Ovipositor thin, downcurved at apex.
 Hind tibia and hind tarsus rather short ; hind spurs short, the inner one not
 quite reaching to middle of hind basitarsus ; antenna rather short, with the pre-
 apical segment about one and one third times longer than wide 25
 - Ovipositor thick, evenly downcurved throughout but not strongly so 26
 25 Ovipositor more abruptly downcurved at apex ; ovipositor sheath narrower (Text-
 fig. 161) ; claws of hind tarsus less well developed ; hypopygium less well
 developed and less strongly sclerotised *oscus* sp. n. (p. 116)
 - Ovipositor less abruptly downcurved at apex ; ovipositor sheath considerably
 thicker ; claws of the hind tarsus more strongly developed ; hypopygium more
 strongly developed, longer, more heavily sclerotised (Text-fig. 92)
 *olorus* sp. n. (p. 117)
 26 Ovipositor slightly less thick ; fore wing with more pigmentation, at least the 1st and
 2nd abscissae of the discoideus and the nervulus fully pigmented ; stigma dark,
 only faintly paler medially ; tergite 1 more strongly narrowed behind ; antenna
 markedly shorter than the body ; inner spur of the hind tibia more obviously longer
 than the 2nd segment of the hind tarsus *rhipheus* sp. n. (p. 117)
 - Ovipositor thicker (Text-fig. 108) ; fore wing glass-clear with milky tint and the
 venation proximal to the areolet without pigmentation ; stigma almost colourless,
 with thin, dark border ; tergite 1 less strongly behind ; antenna about as long as
 the body ; inner spur of the hind tibia less obviously longer than the 2nd segment
 of the hind tarsus *paralus* sp. n. (p. 117)
 27 Mesoscutum very shiny, its sculpture superficial except for the usual coarsening of
 sculpture at the posterior end of the notaulic courses ; antenna very short, about

- as long as head plus thorax ; the four preapical segments virtually square in outline ; median cell almost bare and in distal half with about 6 setae ; ovipositor very long, about twice as long as its sheath, rather thin and abruptly downcurved in apical third (Text-fig. 102) *oroetes* sp. n. (p. 119)
- Mesoscutum dull all over, finely rugose, the notaulic courses showing as still duller bands that widen posteriorly ; antenna nearly as long as the body, with the four preapical segments distinctly longer than wide ; median cell fairly densely setose, though at first sight appearing nearly bare, the setae colourless and easily overlooked ; ovipositor much shorter, evenly and weakly curved throughout 28
- 28 Disc of scutellum more strongly, even quite strongly, rugose all over ; mesoscutum more strongly rugose, the duller bands of the notaulic courses in weaker contrast with the rest of the surface ; ocelli further apart, the distance between the anterior ocellus and a posterior ocellus almost one and a half times greater than the diameter of the posterior ocellus *hersilia* sp. n. (p. 119)
- Disc of scutellum less strongly rugose ; mesoscutum less strongly rugose, the duller bands of the notaulic courses in stronger contrast with the rest of the surface and more obviously widened posteriorly ; ocelli closer together, the distance between the anterior ocellus and a posterior ocellus not greater than the diameter of the posterior ocellus *coilus* sp. n. (p. 119)
- 29 Ovipositor very thick, straight, except at apex (Text-fig. 104) ; distance between the posterior ocelli distinctly greater than the distance between one of them and the eye-margin ; antenna much shorter than the body *alaspharus* sp. n. (p. 114)
- Ovipositor much thinner, slightly curved throughout ; this distance not at all greater than the distance between a posterior ocellus and the eye-margin ; antenna about as long as the body *evadne* sp. n. (p. 116)

Apanteles trabea sp. n.

♀. Legs entirely dark. Wings faintly tinted ; stigma pale with distinctly darker border.

Frons above, vertex and temples appearing dull and greyish owing to fine microsculpture and fine pubescence. Eyes (Text-fig. 97). Antenna a little shorter than the body, thin and with the preapical segment fully one and one third times longer than wide.

Mesoscutum evenly dull, densely, evenly rugose-punctate. Propodeum dull, strongly rugose all over ; areola not defined. Median cell of the fore wing densely setose all over ; hind wing rather narrow. Hind tarsus long, very slender.

Gaster thickly, conspicuously hairy. Tergite 1 parallel-sided, dull, finely, evenly rugose. Ovipositor sheath about three quarters as long as the hind tibia.

Length: ca. 2.5 mm. without ovipositor.

S. AFRICA : Cape Province, Mossel Bay, 6.xii.1933, 1 ♀, the *TYPE*, (*R. E. Turner*). Type in the British Museum (Nat. Hist.).

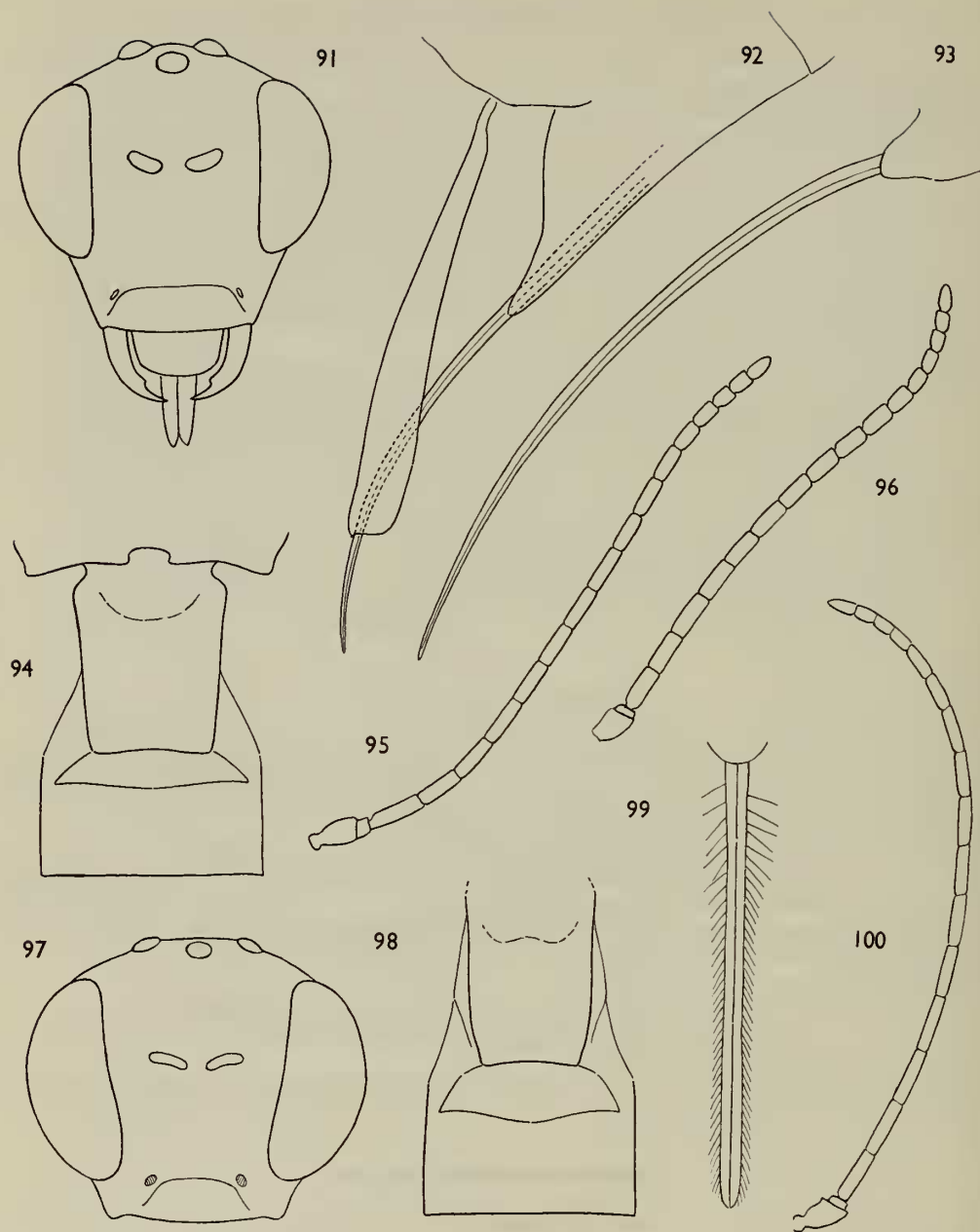
A most distinctive species on account of the short metacarp, convergent eyes and coarse thoracic sculpture.

Apanteles rosaces sp. n.

♀. Another species with the head subtriangular from in front but not at all closely related to *trabea*.

Hind tibia dark brown on apical half but becoming very faintly paler towards base ; hind tarsus dark brown throughout. Wings glass-clear but the stigma evenly brown.

Head from in front (Text-fig. 91). Eyes not at all convergent. Face shiny, smooth. Antenna fully as long as the body, very thin and with the preapical segment fully one and half times longer than wide.



FIGS. 91-100. *Apanteles*, ♀: 91, *rosaces* sp. n., head, from in front; 92, *olorus* sp. n., ovipositor; 93, *rhipheus* sp. n., same; 94, *alaspharus* sp. n., basal tergites; 95, *hersilia* sp. n., antenna; 96, *coilus* sp. n., same; 97, *trabea* sp. n., head, from in front; 98, *evadne* sp. n., basal tergites; 99, *rhipheus* sp. n., ovipositor sheath, from above; 100, *camirus* sp. n., antenna.

Mesoscutum weakly shining, finely rugose and nowhere with obvious punctation ; a large patch of duller, coarser rugosity at the posterior end of the notaulic course. Disc of scutellum distinctly rugose along sides. Propodeum on each side of the weakly defined V-shaped areola strongly shining and almost smooth. Hind tibia with a series of stout spines along upper, outer surface (these are rather more numerous and more evenly spaced than in *eriophyes*). Edge of vannal lobe slightly concave.

Horizontal part of tergite 1 fairly strongly narrowed to apex (Text-fig. 103), its surface shiny, almost smooth except for a very fine surface sculpture. Ovipositor rather thick with a distinct apical constriction.

Length: ca. 2.5 mm. without ovipositor.

S.W. AFRICA : Aus, i.1930, 2 ♀♀, one the *TYPE*, 8-30.xi.1929, 1 ♀, (*R. E. Turner*). Type in the British Museum (Nat. Hist.).

This species is largely characterized by the shortness of the ovipositor sheath ; the metacarp is relatively slightly longer than in the related *eriophyes* and the wings have a particularly glassy appearance.

Apanteles arion sp. n.

♀. Very close to *rosaces* from which it differs chiefly by the characters given in the key.

Hind tibia almost as black as its femur.

Antenna of decidedly powerful build in comparison with that of *rosaces*.

Scutellum dull, punctate, though the punctures are weaker and sparser medially. Metacarp slightly longer, about one and a half times longer than its distance from the apex of the radial cell. Spines along upper, outer surface of hind tibia shorter and rather more numerous than in *rosaces*.

Tergite 1 hardly narrowed behind but its sculpture like that of *rosaces*. Ovipositor thicker, and though with a constricted apical part, shorter than in *rosaces*.

S. AFRICA : Cape Province, Matjesfontein, 14-27.xi.1928, 1 ♀, the *TYPE*, (*R. E. Turner*).

Type in the British Museum (Nat. Hist.).

This species is very closely related to *rosaces* but is certainly distinct from that species.

Apanteles eriophyes sp. n.

♀. Very closely related to *rosaces* with which it may be compared as follows:—

Stigma somewhat yellowish with a darker border ; wings milky white rather than clear hyaline.

Head from in front less rostriform (cf. Text-fig. 91). Antenna considerably shorter than the body, lacking the characteristically thin appearance of *rosaces* and with the preapical segment not more than one and one third times longer than wide.

Spines of the outer side of the hind tibia slightly less numerous (not an easy difference to appreciate!).

Ovipositor thinner, without an obvious apical constriction.

Length: 2-2.4 mm. without ovipositor ; on the average a slightly smaller species than *rosaces*.

S. AFRICA : Pretoria, ii.1940, series bred from *Plutella maculipennis*, 1 ♀, the *TYPE*, (*G. C. Ulyett*) ; Cape Province, Aliwal North ; Camp's Bay ; Ceres ; Matjesfontein ; Worcester ; numerous examples (*R. E. Turner*) ; Basutoland, Mamathes.

Type in the British Museum (Nat. Hist.).

Host : *Plutella maculipennis* Curtis. Evidently a gregarious parasite.

The most obvious differences between this species and *rosaces* lie in the length of the antenna and of the ovipositor sheath.

Apanteles patens sp. n.

♀. This species is related to both *eriophyes* and *rosaces* on the shortness of the metacarp and in having a somewhat triangular head as seen from in front. It may be compared with these two species as follows:—

Hind tibia becoming markedly yellowish on basal half. Wings distinctly brownish.

Face dull, finely roughened. Antenna almost as long as in *rosaces* but slightly less thin and with the preapical segment about one and one third times longer than wide.

Mesoscutum duller, more coarsely sculptured than in either *rosaces* or *eriophyes*. Propodeum dull, finely sculptured all over. Median cell densely setose all over ; hind wing narrower than in *eriophyes*.

Tergite 1 shorter, almost subquadrate and, like the median field of tergite (2 + 3), dull, with a fine, almost shagreened surface ; rest of tergite (2 + 3) microscopically roughened, with a dull, satin-like sheen. Pubescence of gaster very fine and inconspicuous. Ovipositor sheath about three quarters as long as the hind tibia.

Length: ca. 2.5 mm. without ovipositor.

S. AFRICA : Cape Province, Mossel Bay, 5-31.vii.1921, 1 ♀, the *TYPE*, (*R. E. Turner*).

Type in the British Museum (Nat. Hist.).

With regard to the appearance of the wings—colour and dense, dark setae of the median cell—this species is also very like *trabea*. It differs, however, from this species strikingly in having non-convergent eyes. The sculpture of the basal tergites of *patens* is very characteristic.

Apanteles camirus sp. n.

♀. Another species with a markedly rostriform face and short metacarp but differing from *trabea*, *rosaces*, *eriophyes* and *patens* in having a much longer ovipositor and a longer, extremely thin antenna (Text-fig. 100).

Eyes not at all convergent. Face strongly shining. Antenna with the preapical segment about one and a half times longer than wide ; segment 14 fully twice as long as wide.

Sculpture of mesoscutum and disc of scutellum as in *rosaces*. Propodeum as described for *rosaces*. Wings as in *rosaces* and *eriophyes* ; stigma evenly dark brown ; setae of the median and submedian cells very sparse.

Sculpture and shape of tergites 1 and (2 + 3) as in *rosaces* ; sometimes the horizontal part of tergite 1 shows a weak indication of a longitudinal furrow.

Length: ca. 3 mm. without ovipositor.

S. AFRICA : Cape Province, Matjesfontein, 7-13.xi.1928, 12 ♀♀, one the *TYPE*, 14-27.xi.1928, 4 ♀♀, (all *R. E. Turner*).

Type in the British Museum (Nat. Hist.).

An easily distinguished species, most clearly related perhaps to *rosaces* but differing at once from that species on the length of the ovipositor.

Apanteles eupolis sp. n.

♀. A species with non-convergent eyes and a metacarp between four and five times as long as its distance from the apex of the radial cell.

Wings hyaline with a milky tint ; stigma yellowish brown with darker border ; setae colourless.

Mesoscutum somewhat dull, with two large, duller areas of stronger, coarser rugosity behind. Areola of the propodeum and the two postero-lateral areas indicated through the surface becoming strongly shining and almost smooth.

Tergite 1 large, almost subquadrate. Ovipositor moderately thick.

Length: ca. 2.8 mm. without ovipositor.

S. AFRICA : Cape Province, Mossel Bay, x.1921, 2 ♀♀, one the *TYPE*, 5-31.viii.1921, 1 ♀, (*R. E. Turner*).

Type in the British Museum (Nat. Hist.).

This species is largely characterized by the shape of the first tergite. The appearance of the gaster is, in fact, strongly reminiscent of *cyprionides*, a species I have placed near the oriental *opacus*. A resemblance to *cyprionides* is also indicated in the approach to propodeal areolation. Nevertheless, I am inclined to think that this resemblance is due more to convergence than to natural affinity.

Apanteles navius sp. n.

♀. Although falling in the same couplet as *eupolis*, this species is far more closely related to *rosaces* and its allies than to *eupolis*.

Hind tibia becoming markedly paler on basal half. Wings milky hyaline ; stigma pellucid with faintly darker border.

Eyes not convergent. Head from in front subtriangular ; face faintly dull, with satin-like sheen. Antenna distinctly shorter than the body with the preapical segment about one and a quarter times longer than wide.

Mesoscutum quite dull, its pubescence very dense and silvery. Disc of scutellum faintly dull. Propodeum weakly shining and with traces of sculpture, more especially in front. Hind wing rather broad ; setae of the median cell dense and evenly distributed.

Tergite 1 markedly narrowed behind, its sculpture very fine ; the general appearance of this tergite is quite different from that of *eupolis*. Ovipositor sheath about one and a quarter times as long as the hind tibia.

Length: ca. 2.8 mm. without ovipositor.

S. AFRICA : Basutoland, Mamathes, 8.ii.1948, 2 ♀♀, one the *TYPE*, (*C. Jacot-Guillarmod*).

Type in the British Museum (Nat. Hist.).

Apanteles ione sp. n.

This species and the next—*triareus*—are closely related. Both have a dark brown stigma, glassy wings without a milky tint, distinctly convergent eyes so that the face is much less transverse than in *navius* for example and a somewhat narrow first tergite that is distinctly narrowed behind.

♀. The setae of the four basal cells of the fore wing are unusually sparse and very short and inconspicuous, so that the wings have a polished, glassy appearance. Propodeum on each side

of the weakly indicated areola becoming smooth and highly polished. Ovipositor sheath as long as the hind tibia ; ovipositor rather thin.

Length: ca. 2.2 mm. without ovipositor.

S. W. AFRICA : Aus, i.1930, 1 ♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

The fore wing of this species shows the same degree of setosity as in *rosaces* but the two species are different on the length of the metacarp *inter alia*.

Apanteles triareus sp. n.

The differences between this species and *ione* have been mentioned above.

♀. Posterior ocelli further apart, the distance between them distinctly greater than the distance between one of them and the eye-margin.

The fore wing lacks the glassy, highly shining appearance seen in *ione*, largely due to the setae being more numerous. Propodeum covered all over with short, wavy rugae.

Ovipositor sheath with long, more upstanding hairs ; ovipositor slightly thicker and less curved.

S. AFRICA : Cape Province, Mossel Bay, 24.xii.1938, 1 ♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

Apanteles dido sp. n.

♀. Closely related to both *triareus* and *ione*, with the posterior ocelli as wide apart as in *triareus*.

The appearance of the mesoscutum and of the disc of the scutellum is exactly as in *triareus*. The wings are more like those of *triareus* than *ione* ; the setae of the basal cells of the fore wing are colourless whereas in *triareus* and *ione* they are brownish.

Ovipositor thicker than in both the related species, evenly and quite strongly curved throughout.

Length: ca. 2 mm., without ovipositor.

S. AFRICA : Cape Province, Mossel Bay, 5-31.vii.1921, 1 ♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

The form of the antenna is important for the recognition of this species ; it is hardly different from that of *camirus* (cf. Text-fig. 100).

Apanteles articas sp. n.

♀. Hind tibia dark brown throughout. Stigma almost colourless, faintly bordered with darker colouring ; metacarp brown ; venation proximal to the areolet colourless.

Head from in front not in the least triangular, the face wide and the eyes not convergent. Antenna short, shorter than the body, with the preapical segment about one and a quarter times longer than wide.

Sculpture of the mesoscutum more or less hidden by the dense pubescence ; very fine, dull, slightly duller along the course of the notaulices. Propodeum typical of the *eublemmae*-subgroup ; areola virtually not indicated. Metacarp hardly twice as long as its distance from the apex of the radial cell.

Tergite 1 rather broad, hardly narrowed behind, its surface shiny in spite of weak rugosity that is more in evidence towards sides. Ovipositor sheath as long as the hind tibia ; ovipositor moderately thick.

Length: ca. 2.5 mm. without ovipositor.

W. AFRICA : Senegal, Bambey, 2 ♀♀, one the *TYPE*, ex *Argyroploce wahlbergiana* on rice, (*J. Risbec*).

Type in the British Museum (Nat. Hist.).

Host : *Argyroploce wahlbergiana* Zeller (Tortricidae).

A very distinct species, characterized by its ivory-white tegulae and the curiously dense, silky pubescence of the mesoscutum and disc of scutellum.

Apanteles mutilia sp. n.

♀. A second species with densely pubescent mesopleurum and a mesoscutal pubescence similar to that of *articas*, to which species it is closely related, differing from it only in a few details.

Head above appearing slightly more greyish owing to denser pubescence.

Lateral, polished zone of the scutellum pushed further forwards, the furrow between itself and the disc narrower than in *articas*.

Tergite 1 with its horizontal surface more elongate (Text-fig. 107), its surface smoother, almost unsculptured. Ovipositor sheath about one and a quarter times longer than the hind tibia, falcate apically ; ovipositor thinner, distinctly falcate apically.

AFRICA : Sudan, 1 ♀, the *TYPE*, bred, 7.iv.1929, from gall on " talh ", (*H. W. Bedford*).

Type in the British Museum (Nat. Hist.).

Apanteles nepe sp. n.

♀. Hind tibia dull reddish, becoming infusate in about apical third. Stigma dark brown. Eyes hardly convergent. Distance between the posterior ocelli considerably greater than the distance between one of them and the eye-margin.

Sculpture of mesoscutum like that of *eupolis* and *navius*. Propodeum shiny in spite of feeble rugosities. Metacarp slightly longer than twice its distance from the apex of the radial cell.

Ovipositor sheath slightly longer than the hind tibia ; ovipositor rather thin, weakly curved.

Length: ca. 2.3 mm. without ovipositor.

S. AFRICA : Cape Province, Matjesfontein, 7-13.xi.1928, 1 ♀, the *TYPE*, (*R. E. Turner*).

Type in the British Museum (Nat. Hist.).

Distinct from all the other species of the *eublemmae*-subgroup on the spines of the outer side of the hind tibia.

Apanteles lycidas sp. n.

♀. A species with normal mesopleural pubescence and with a mesoscutal pubescence more like that of the species clustering around *rosaces* and *navius* than *articas* and *mutilia*.

The venation proximal to the areolet is weakly but distinctly pigmented.

Eyes distinctly convergent below. Face somewhat dull and finely roughened. Antenna almost as long as the body with the preapical segment about one and one third times longer than wide.

Mesoscutum with a dull, even, rather coarse rugosity, the surface appearing somewhat silvery-grey. Metacarp about twice as long as its distance from the apex of the radial cell.

Tergite 1 distinctly narrowed behind, as in *rosaces*, (Text-fig. 103). Ovipositor sheath about as long as the hind tibia; ovipositor moderately thick.

Length: ca. 2.5 mm. without ovipositor.

S. AFRICA : Cape Province, Mossel Bay, iv.1921, 1 ♀, the *TYPE*, 26-31.x.1933, 1 ♀, (*R. E. Turner*) ; Somerset East, 23-31.xii.1930, 1 ♀, (*R.E.T.*).

Type in the British Museum (Nat. Hist.).

Apanteles alaspharus sp. n.

♀. Wings hyaline with milky tint ; the venation proximal to the areolet colourless ; stigma very pale, virtually without darker border.

Head from in front somewhat triangular but the mouth parts apparently not lengthened. Antenna shorter than the body with the preapical segment slightly longer than wide.

Sculpture of mesoscutum fine, dull. Propodeum short, its surface shiny and almost smooth. Spurs of the hind tibia short, the inner one not reaching beyond the middle of the basal segment of the tarsus. Metacarp about three and a half times as long as its distance from the apex of the radial cell.

Tergite 1 very slightly narrowed behind (Text-fig. 94), its surface almost smooth. Ovipositor (Text-fig. 104).

Length: ca. 2.8 mm. without ovipositor.

S. AFRICA : Cape Province, Toise River, xi.1923, 1 ♀, the *TYPE*, ex larva of *Eublemma lentirosa*, (*N. K. Munro*).

Type in the British Museum (Nat. Hist.).

Host : *Eublemma lentirosa* Hampson (Noctuidae).

I refer to this species a single headless female from Senegal, Bambey, bred from a *Limacodid* on cabbage. It differs from the type in a few details and may in fact, were the head present, represent a different species. The hind tibia of this female is dull reddish whereas in the type it is very dark on apical half; the first tergite is broader and not narrowed behind (Text-fig. 94) and the hind spurs are slightly shorter than in the type.

A. alaspharus differs strikingly from the other members of the *eublemmae*-subgroup because of its long, thick ovipositor.

Apanteles nemesis sp. n.

♀. Tegulae ivory-white ; at least the 1st and 2nd abscissae of the discoideus and also the nervulus distinctly pigmented.

Head from in front markedly transverse. Face dull, with satin-like sheen. Eyes hardly convergent. Distance between the posterior ocelli distinctly greater than the distance between one of them and the eye-margin. Antenna very short, the four preapical segments virtually square in outline.

Mesoscutum dull, its sculpture very fine ; a patch of duller sculpture at posterior end of notaulic courses. Metacarp three times as long as its distance from the apex of the radial cell.

Tergite 1 slightly narrowed behind, strongly shining, almost polished and with hardly a trace of sculpture. Ovipositor sheath as long as the hind tibia; ovipositor somewhat thick, evenly curved throughout.

Length: ca. 1.8 mm. without ovipositor.

S. W. AFRICA: Aus, i.1930, 2 ♀♀, one the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

Apanteles nivellus sp. n.

♀. This species is extremely like *nemesis*. The differences between the two species, though small, are significant enough, I think, for specific separation. A comparison follows:—

Tegulae brownish and inconspicuous; all the venation proximal to the areolet colourless.

Face strongly shining. Antenna relatively a little shorter, much shorter than the body, with the apical segments less closely articulated and the whole flagellum with somewhat bristly pubescence. Ocelli closer together, the distance between the posterior pair being not at all greater than the distance between one of them and the eye-margin.

Disc of scutellum smoother, more shiny than in *nemesis*.

Tergite 1 more narrowed behind and with the dull satin-like sheen characteristic of most of the related species.

W. AFRICA: Gold Coast, Aburi, 1912–1913, 12 ♀♀, one the *TYPE*, (W. H. Patterson). From the size of the series it is probable that the species is gregarious.

Type in the British Museum (Nat. Hist.).

Apanteles drupes sp. n.

♀. Closely related to both *nemesis* and *nivellus*. It may be compared with *nemesis* as follows:—

Tegula blackish, inconspicuous. Venation proximal to the areolet pigmented throughout; stigma darker, yellowish but with distinctly darker border.

Head from in front slightly less transverse. Antenna longer, the four preapical segments about one and a quarter times longer than wide.

Mesoscutum slightly more shiny but the difference is small. Metacarp a little longer in relation to its distance from the apex of the radial cell, about four times as long; 1st cubital cell rather densely setose.

Tergite 1 more narrowed behind than in *nemesis* and with a dull, satin-like sheen. Ovipositor considerably thinner, downcurved at apex (Text-fig. 105).

S. AFRICA: Cape Province, Mossel Bay, vi.1921, 1 ♀, the *TYPE*, x.1921, 1 ♀, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

This species together with *nemesis* and *nivellus* are all very closely related and in need of further study. They differ among themselves essentially on the structure of the ovipositor.

Apanteles eublemmae sp. n.

♀. A large species, ca. 3 mm. without ovipositor, closely related to *nemesis* and *drupes*.

Hind tibia blackish except at extreme base; wings milky-white; stigma very pale; venation proximal to the areolet colourless.

Head from in front very slightly transverse. Face shining, almost smooth. Top of head completely dull, owing to fine rugosity overlaid with a satin-like sheen. Antenna shorter than the body with the preapical segment about one and a third times longer than wide.

Sculpture of mesoscutum fine, exactly as in *nemesis* and *drupes*. Propodeum typical of group ; on either side of a weakly defined areola, the surface is dull, almost smooth. Metacarp about three times as long as its distance from the apex of the radial cell ; hind wing decidedly broad.

Tergite 1 only very slightly widened behind ; its horizontal surface dull, with a very fine microsculpture and having a satin-like appearance. Ovipositor sheath as long as the hind tibia (Text-fig. 106).

E. AFRICA : Tanganyika Territory, Moshi, vii.1929, 3 ♀♀, one the TYPE, ex " pupa " of *Eublemma costimacula*, (A. H. Ritchie) ; Kenya, Kiambu, 1932, 7 ♀♀, 1 ♂, ex *Eublemma costimacula* (R. H. le Pelley). S. AFRICA : Pondoland, Port St. John, v.1924, 1 ♀, (R. E. Turner) ; Cape Province, Mossel Bay, ii.1932, 1 ♀, (R. E. T.). Type in the British Museum (Nat. Hist.).

Host : *Eublemma costimacula* Saalmüller (Noctuidae).

Apanteles evadne sp. n.

♀. Tegula ivory-white. Wings milky-white ; stigma pale ; venation proximal to the areolet colourless. Hind tibia virtually black throughout.

Vertex shiny and with hardly a trace of the dull surface sculpture characteristic of the *eublemmae*-subgroup. Face smooth, shiny. Head from in front not in the least subtriangular. Eyes not convergent. Antenna about as long as the body with the preapical segment about one and a half times longer than wide.

Mesoscutal sculpture typical of the subgroup. Disc of scutellum polished and with only a faint trace of roughness along sides. Propodeum rather long, with large, well defined U-shaped areola, which is above almost closed and within, polished. Legs slender ; hind tarsus particularly long. Metacarp about three times as long as its distance from the apex of the radial cell ; 1st abscissa of the radius fully twice as long as the transverse cubitus.

Tergite 1 shiny, without a satin-like sheen, covered with sparse rugosities and irregular pits. Gaster elongate, with the median field of tergite (2 + 3) relatively large (Text-fig. 98). Ovipositor moderately thick.

Length: ca. 2.8 mm. without ovipositor.

AFRICA : Uganda, Kampala, 5.x.1929, 1 ♀, the TYPE, ex *Tortrix* sp., (G. L. R. Hancock) ; Bukalata, 11.viii.1935, 1 ♀, ex cocoon on cotton leaf, (T. H. C. Taylor).

Type in the British Museum (Nat. Hist.).

This slenderly built species is not altogether typical of the *eublemmae*-subgroup, especially with regard to the long first abscissa of the radius. It could be confused only with *alaspharus* on the length of the ovipositor, though this is much thinner in *evadne*. Furthermore, *evadne* has a longer antenna than *alaspharus*.

Apanteles oscus sp. n.

♀. This species is closely related to *olorus*.

Build slightly less robust. Metacarp about five times as long as its distance from the apex of the radial cell. Tergite 1 slightly less narrowed apically. Ovipositor (Text-fig. 101).

Length: ca. 2.5 mm. without ovipositor.

S. AFRICA : Pondoland, Port St. John, 12-30.vi.1933, 1 ♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

Apanteles olorus sp. n.

♀. Metacarp about four times as long as its distance from the apex of the radial cell. Hind tibia and hind tarsus slightly thicker than in *osculus* with fewer thickened spines on the outer side of the hind tibia. Tergite 1 slightly more narrowed apically than in *osculus*. Hypopygium (Text-fig. 92).

S. AFRICA : Pondoland, Port St. John, x.1923, 1 ♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

The difference between this species and *osculus* are decidedly tenuous and further specimens may show that they are not valid for specific differentiation.

Apanteles rhipheus sp. n.

♀. This species differs from both *osculus* and *olorus* in having a much thicker ovipositor. It is closely related to *eublemmae* with which it may be compared as follows:—

Stigma less pallid ; venation proximal to the areolet clearly pigmented. Hind wing narrower. Tergite 1 more narrowed behind. Ovipositor longer (Text-fig. 99).

S. AFRICA : Cape Province, Mossel Bay, 18-30.xi.1921, 1 ♀, the *TYPE*, 5-31.vii.1921, 1 ♀, xii.1921, 1 ♀, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

Apanteles paralus sp. n.

♀. In colour, the wings of this species are indistinguishable from those of *eublemmae* but the metacarp is slightly longer in relation to its distance from the apex of the radial cell.

Antenna as long as the body, that is, markedly longer than in both *rhipheus* and *eublemmae*. Disc of scutellum more narrowed behind than in *eublemmae*, slightly convex and sculptured weakly almost all over ; towards sides the sculpture becomes longitudinal.

Tergite 1 markedly rugose compared with *eublemmae*. Ovipositor sheath longer than in *eublemmae* and the ovipositor considerably thicker.

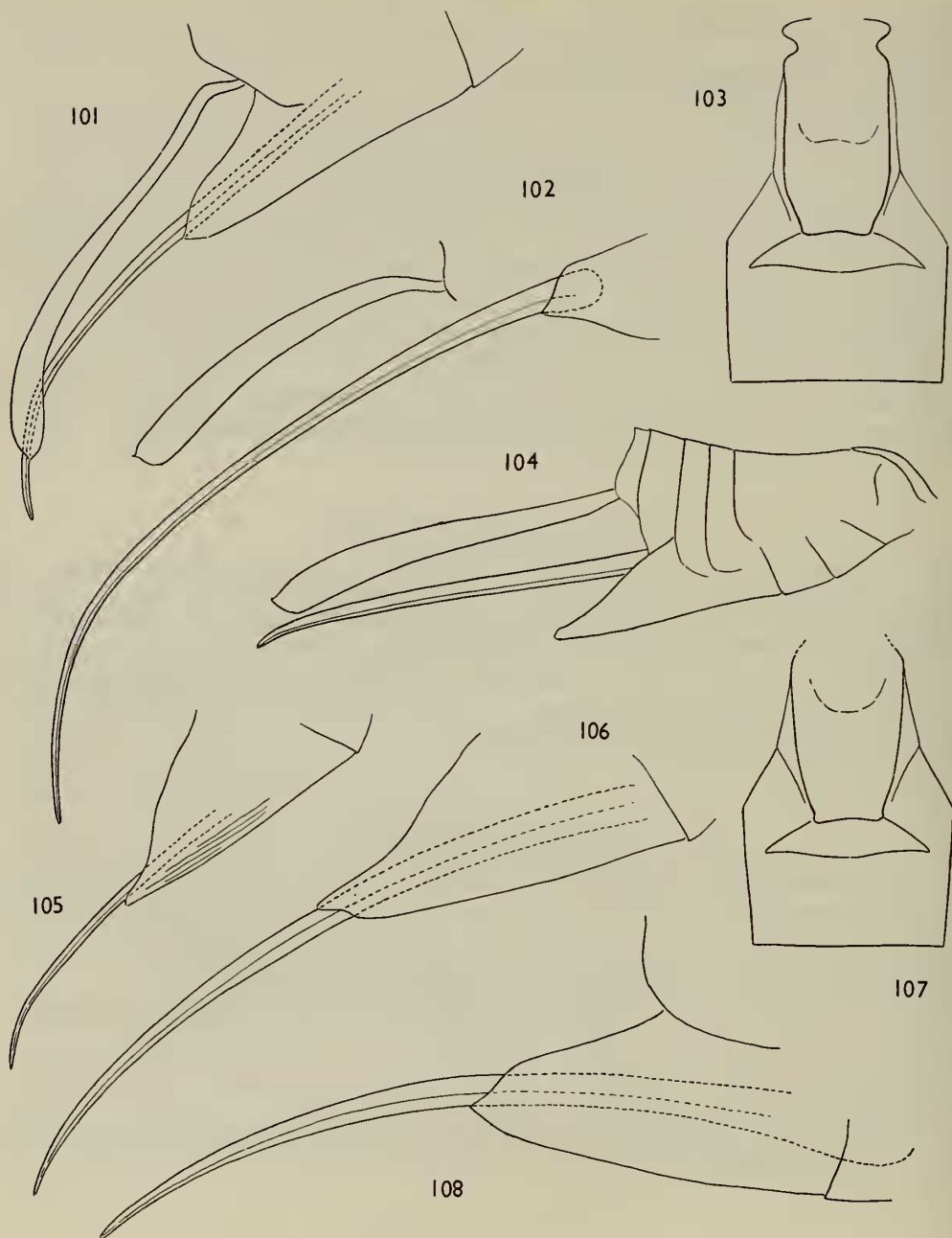
S. AFRICA : Cape Province, Ceres, 2-21.iii.1921, 1 ♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

The relationship between this species and *eublemmae-rhipheus* is very close and the species are in need of further study.

Apanteles upis sp. n.

♀. Here is a species closely related to both *eublemmae* and *rhipheus* but differing from both in having the metacarp about twice as long as its distance from the apex of the radial cell. It is more like *rhipheus* than *eublemmae*, differing from it only in a few details:—



FIGS. 101-108. *Apanteles*, ♀: 101, *oscus* sp. n., ovipositor; 102, *oroetes* sp. n., same; 103, *rosaces* sp. n., basal tergites; 104, *alaspheus* sp. n., ovipositor; 105, *drupes* sp. n., same; 106, *eublemmae* sp. n., same; 107, *mutilia* sp. n., basal tergites; 108, *paralus* sp. n., ovipositor.

Propodeum with slightly more rugosity ; areola almost closed above. Hind wing slightly broader than in *rhipeus*. Ovipositor sheath slightly shorter ; seen from above, with its hairs much more upstanding (cf. Text-fig. 99).

PHILIPPINES : Mt. Banahao, 1 ♀, the *TYPE*, (*Baker*) ; Bukidnon, Tangcolan, 1 ♀, (*Baker*).

Type in the U.S. National Museum.

This is the only species of the *eublemmae*-subgroup, that is known to me outside the continent of Africa.

Apanteles oroetes sp. n.

♀. Wings clear hyaline without milky tint ; stigma dark brown.

Propodeum very smooth, its satin-like sheen very weak.

Tergite 1 strongly narrowed behind, its surface like that of the propodeum. Ovipositor sheath about as long as the hind tibia but the ovipositor fully twice as long as its sheath.

Length: ca. 2 mm. without ovipositor.

S. W. AFRICA : Aus, i.1930, 1 ♀, the *TYPE*, (*R. E. Turner*).

Type in the British Museum (Nat. Hist.).

With its very short antenna and long ovipositor, this little species is very distinct. No other species in the *eublemmae*-subgroup shows a similar reduction in the strength of the mesoscutal sculpture.

Apanteles hersilia sp. n.

This species and the next—*coilus*—are closely related.

♀. Head somewhat triangular from in front ; in a lateral view, the clypeus somewhat protuberant. Antenna thin, about as long as the body and of somewhat characteristic appearance ; the flagellar segments rather abruptly diminish in length towards apex (Text-fig. 95) ; the preapical segment is fully one and a half times longer than wide.

Tergite 1 widened just where it turns over and thence narrowed to apex but not strongly so, its surface quite strongly rugose.

Length: ca. 2.4 mm. without ovipositor.

S. AFRICA : Cape Province, Mossel Bay, iv.1921, 1 ♀, the *TYPE*, (*R. E. Turner*).

Type in the British Museum (Nat. Hist.).

This little species is essentially characterized by the coarseness of its mesoscutal and scutellar sculpture.

Apanteles coilus sp. n.

♀. Head not in the least subtriangular seen from in front ; in a lateral view, the clypeus not protuberant as in *hersilia*. Antenna a little shorter, of ordinary appearance (Text-fig. 96). Sculpture of tergite 1 and of propodeum finer than in *hersilia*. Tergite 1 hardly widened just where it turns over, as in *hersilia*.

S. AFRICA: Cape Province, Ceres, iii.1925, 2 ♀♀, one the *TYPE*, iv.1925, 1 ♀ ; Aliwal North, 4,350 ft., 1-13.i.1923, 1 ♀, (all *R. E. Turner*).

Type in the British Museum (Nat. Hist.).

There is nothing particularly distinctive about this species ; its sculpture is like that of the majority of the species in the *eublemmae*-subgroup.

Apanteles linus sp. n.

♀. Head from in front not in the least subtriangular. Face faintly dull. Eyes virtually not convergent. Vertex behind the eyes and the temples more strongly roughened than in most of the species of the *eublemmae*-subgroup, the surface covered with fine, raised points. Antenna almost as long as the body with the preapical segment fully one and one third times longer than wide.

Sculpture of the mesoscutum hardly different from that of *eublemmae*. Metacarp about four and a half times longer than its distance from the apex of the radial cell; hairs of the median cell decidedly sparse along the medius side.

Tergite 1 almost parallel-sided, its horizontal surface very slightly transverse. Ovipositor sheath slightly shorter than the hind tibia.

Length: ca. 3 mm. without ovipositor.

S. AFRICA: Natal, Kloof, 1,500 ft., viii.1926, 1 ♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

With regard to the sculpture of the propodeum and of tergite 1, this species is transitional between the species of the *metellus*-complex and the *eublemmae*-subgroup but the wing venation and the shape of the furrows on the side of the pronotum are typical of the *eublemmae*-subgroup.

THE *TAENIATICORNIS* GROUP

Metacarp many times longer than its distance from the apex of the radial cell; hind wing only moderately broad, the length of the 2nd abscissa of the mediella hardly shorter than the distance between its distal extremity and the apex of the vannal lobe (Text-fig. 177); median and submedian cells densely setose all over. Areolation of the propodeum sharp, complete.

Indo-australian region.

This group is largely characterized by the long metacarp in combination with the shape of tergite 1 (Text-fig. 183). It cannot be regarded as sharply distinct from the *ater*-group s.l. and merges into it through such species as *cestius* and *dissors*, both of which I have placed in the *ater*-group.

KEY TO SPECIES

FEMALES

- 1 Sternaulus in the form of a deep, rugulose furrow that extends upwards towards the subalar furrow (Text-fig. 202).
Hind femur entirely yellow; vannal lobe beyond its widest part straight and here with an occasional projecting hair 2
- Sternaulus, if indicated, then in the form of a smooth, broadly hollowed-out furrow 3
- 2 Mesoscutum dull, densely, coarsely rugose-punctate to reticulate-punctate; sternaulus longer, extending upwards as a narrowing, subfoveate groove, virtually as far as the subalar furrow (Text-fig. 202); flagellum longer, showing no distal thickening, the preapical segment about one and a half times longer than wide
phalis sp. n. (p. 121)
- Mesoscutum less dull, and although densely punctate, the sharp, rather large punctures are neither close enough, nor coarse enough, to form rugose-punctuation; sternaulus shorter, more evenly deepened and not extending further upwards than the middle

of the upper, convex part of the mesopleurum ; flagellum shorter, showing a distal thickening with at least the two preapical segments only slightly longer than wide

myrsus sp. n. (p. 121)

- 3 Flagellum with a conspicuous yellow band, embracing segments 9-12

taeniaticornis Wilkinson (p. 123)

- Flagellum without such a band though it may become very faintly paler distally . 4

- 4 Hind tibia densely spinose along its upper surface (Text-fig. 200) ; mesoscutum dull, densely, sharply punctate.

Hind claw long and conspicuous, about as long as the fourth segment of the hind tarsus

natras sp. n. (p. 123)

- Hind tibia not thus densely spinose; mesoscutum shiny at least on posterior half, its punctation slightly less sharp than in *natras* 5

- 5 Hind claw long (Text-fig. 194), hardly shorter than the fourth segment of the hind tarsus ; antenna faintly paler towards apex and slightly thickened distally, segment 16 being about one and a quarter times longer than wide

nymphis sp. n. (p. 123)

- Hind claw much shorter than the fourth segment of the hind tarsus (Text-fig. 193) ; antenna very thin, not at all paler distally with segment 16 fully one and a half times longer than wide

conon sp. n. (p. 124)

Apanteles phalis sp. n.

♀. Legs predominantly yellowish with the apex of the hind tibia and the whole of the hind tarsus faintly infusate ; hind coxa pale brown. Wings faintly brownish ; venation fully pigmented ; stigma brown but not dark brown.

Face smooth, shining. Head above having a smooth, shiny appearance. Distance between a posterior ocellus and the eye-margin fully twice the longer diameter of the ocellus. Antenna longer than the body, thin, the flagellar segments with somewhat bristly pubescence.

The strongly sculptured mesoscutum is in sharp contrast with the smooth head. Disc of scutellum strongly narrowed behind, shiny but with large, though superficial punctures. Metacarp almost closing the radial cell ; hind wing decidedly narrow. Inner spur of the hind tibia not quite reaching the middle of the basal segment of the tarsus ; claws of hind tarsus small, inconspicuous.

Tergite 1 long, narrowly wedge-shaped, much as in *taeniaticornis* (cf. Text-fig. 183), its horizontal surface with a vaguely defined trough that is filled with irregular rugosities and is almost as wide as the tergite itself. Ovipositor sheath as long as the hind tibia ; ovipositor rather thin, weakly, evenly curved.

Length: ca. 2.4 mm. without ovipositor.

PHILIPPINES : Manila, 4 ♀♀, one the TYPE, 9 ♂♂, (*R. Brown*).

Type in the U.S. National Museum.

Easily separated from the other species of the group on the form of the sternaulus.

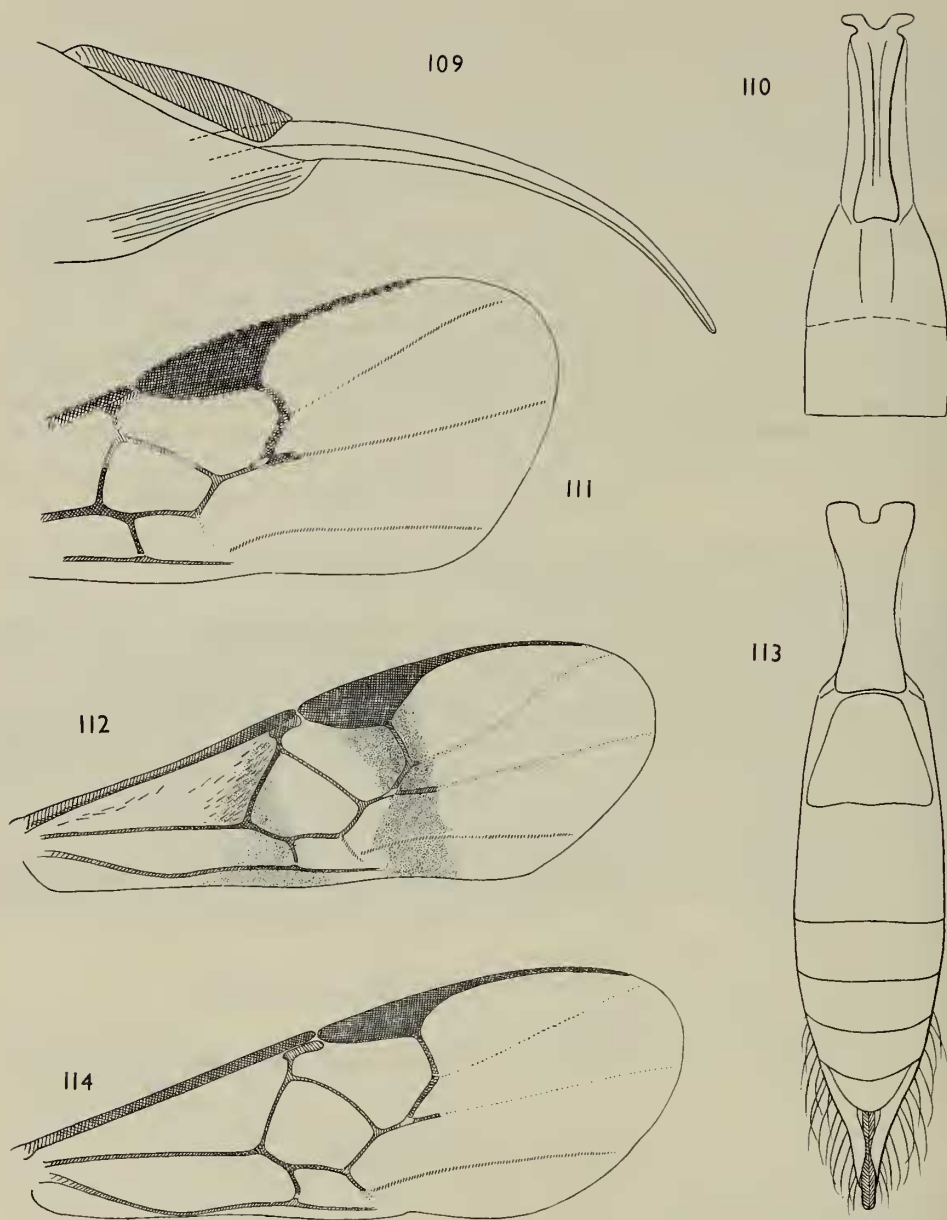
Apanteles myrsus sp. n.

♀. Closely related to *phalis*.

Eyes slightly larger. Distance between a posterior ocellus and the eye-margin distinctly less than the greater diameter of the ocellus.

Furrow between the mesoscutum and the disc of the scutellum slightly less deep than in *phalis* ; disc of scutellum less narrowed behind, slightly flatter and more polished, virtually impunctate.

Tergite 1 not distinctly wedge-shaped though slightly narrowed behind (Text-fig. 181) ; its sculpture, as in *phalis*, coarse.



FIGS. 109-114. *Apanteles*, ♀: 109, *agrus* sp. n., ovipositor; 110, *henricopus* de Saeger, basal tergites; 111, *terminalis* Gahan, fore wing, part; 112, *orphne* sp. n., fore wing (setae of only median cell shown); 113, *pistrinariae* Wilkinson, gaster, dorsal; 114, *iphitus* sp. n., fore wing.

PHILIPPINES : Manila, 11 ♀♀, one the *TYPE*, (R. Brown).

Type in the U.S. National Museum.

Because of its wider first tergite, this species loses something of the characteristic appearance of the *taeniaticornis*-group and might be regarded as transitional between this group and the *ater*-group s.l. The most easily appreciated difference between this species and *phalis* is to be found in the shape of the first tergite.

Apanteles taeniaticornis Wilkinson

Apanteles taeniaticornis Wilkinson, 1928a : 109.

This and the following three species form a very compact segregate.

♀. Black ; gaster somewhat brownish but yellow at base beneath ; membranous sides of tergite 1 yellow. Legs on the whole brightly coloured ; hind trochanters yellow and hind femur pale brown ; hind tibia somewhat darker than its femur and yellowish on about basal quarter. Wings distinctly brownish.

Head deep from back to front (Text-fig. 199) ; above smooth, but with satin-like sheen. Antenna slightly longer than the body, somewhat powerfully built with the preapical segment about one and a half times longer than wide.

Mesoscutum faintly dull and with a satin-like sheen ; its punctuation fine but sharp, finer than in both *nymphis* and *conon*. Disc of scutellum polished, impunctate. Mesopleurum with a large, oblong, smooth depression. Hind claws long, as in *nymphis* (cf. Text-fig. 194). Wings (Text-fig. 177).

Horizontal part of tergite 1 smooth, almost without sculpture. Basal tergites (Text-fig. 183).

Ovipositor sheath about as long as the hind tibia.

Length: ca. 3 mm. without ovipositor.

JAVA : Tjibodas 5-7,000 ft., 4 ♀♀. (Type locality).

Type in the British Museum (Nat. Hist.).

Apanteles natras sp. n.

♀. May be compared with *taeniaticornis* as follows:—

Paler parts of the legs more reddish than yellowish ; hind tibia reddish brown, paler towards apex and throughout on inner side. Wings less smoky. Antenna broken but segment 12 entirely dark brown.

Head less deep from back to front. Temples with faint but distinct indication of punctuation. Basal segments of the flagellum slightly thicker. Ocelli in a slightly lower triangle.

Mesoscutum duller, more strongly and more evenly punctate. Upper, outer side of hind tibia densely spinose (Text-fig. 200) ; hind tarsus decidedly bristly in comparison with that of *taeniaticornis*.

PHILIPPINES : Benaue, Mt. Prov., 30.xii.1953, 1 ♀, the *TYPE*, (H. K. & D. Townes).

Type in Coll. Townes.

Apanteles nymphis sp. n.

♀. Differs from *taeniaticornis* as follows:—

Paler parts of the legs less yellowish but the hind femur paler than in *taeniaticornis* and not darker than the trochanter.

Head from above lacking the subtly distinctive facies of *taeniaticornis* and not so deep from back to front (cf. Text-fig. 199). Antenna slightly longer and thicker, broken after the 16th segment but segment 16 about one and a quarter times longer than wide.

Punctuation of the mesoscutum slightly heavier but the general surface more shiny and lacking the satin-like sheen ; the surface of the mesoscutum is more shiny and, at least posteriorly, smoother than in *natras*. Hind claw (Text-fig. 194).

JAVA : Tjibodas, 5-7,000 ft., viii.1913, 1 ♀, the TYPE, (*Koningsberger*).

Type in the British Museum (Nat. Hist.).

Apanteles conon sp. n.

♀. Differs from *taeniaticornis* as follows:—

Antenna broken after the 16th segment but all existing segments completely black. Colour of legs essentially as in *taeniaticornis* with the hind trochanters yellow as in that species.

Head from above as in *taeniaticornis*. Antenna slightly thinner ; segment 16 fully one and half times longer than wide.

Punctures of mesoscutum slightly larger. Disc of scutellum distinctly convex ; in *taeniaticornis* it is somewhat flattened. Furrow between disc of scutellum and the mesoscutum slightly deeper. Claws smaller (Text-fig. 193).

JAVA : Tjibodas, 5-7,000 ft., viii.1913, 1 ♀, the TYPE, (*Koningsberger*).

Type in the British Museum (Nat. Hist.).

This species is extremely like *taeniaticornis* and *nymphis* and the three species are in need of further study.

THE TRIFASCIATUS-GROUP

The species of this group are all from the Fiji Is., and only *trifasciatus* occurs elsewhere—in Hawaii. But, according to J. W. Beardsley, who was good enough to send me specimens, it is probable that *trifasciatus* itself is an importation into Hawaii.

With the exception of *aglaope*, which belongs to the *ater*-group, I have met with no other species of *Apanteles* showing similar dark markings on the wings. Muesebeck himself made a similar observation. Nevertheless, in spite of their possessing this feature in common, I am not prepared to accept it as a clear indication of a close affinity among these Fijian species. It is possibly no more than a regional pattern, developed independantly by species belonging to different groups.

The species are related to the *ater*-group s.l. *A. cyane* and *A. eurynome* seem to be close to the species clustering around *tirathabae* and *pertiades*.

KEY TO SPECIES

FEMALES

- 1 Inner spur of the hind tibia much longer than the outer one.

Spp. with the fore wing conspicuously dappled ; mesoscutum with a characteristic sculpture ; sharply punctate, the punctures becoming larger and more widely separated posteriorly and fading out altogether over a large, posterior, middle area ; hind tibia densely spinose and prickly, almost black and with a very sharply contrasted, whitish, basal band ; legs decidedly long and with the hind tarsus longer than its tibia ; hind coxa laterally compressed and hence almost ridged dorsally . . .

Inner spur of the hind tibia only slightly longer than the outer one.

Spp. with the fore wing less conspicuously dappled ; hind tibia less spinose and lacking a prickly appearance

3

- 2 Middle third of flagellum orange-yellow ; dark, proximal cloud of the fore wing filling almost half the median cell, the darkened area densely setose ; apex of fore wing with a dark cloud ; cheeks and temples with a duller, more obvious sculpture of contiguous punctation ; mesoscutum in front with an overlay of delicate surface sculpture and with a satin-like sheen ; propodeum posteriorly and especially around the orifice and along the middle deeply scored with coarse rugosities ; hind femur black to almost red ; hind tarsal segment 1 black and contrasting with the remaining segments which are orange-yellow ; middle part of the face reddish like the scape ; ovipositor sheath only slightly longer than the hind tibia.

Tergite (2 + 3) yellowish-orange to a variable extent *trifasciatus* Muesebeck²

HAWAII, Honolulu, type locality. FIJI Is., Viti Levu, 27.xi.1956, 1 ♀, labelled "on coconut-palm-leaf" ; Cicia, Lau, 5.xi.1945, 1 ♀, (*R. A. Lever*). Type in U.S. National Museum.

Host: Type material recorded by Muesebeck as having been bred from cotton bolls.

- Flagellum black throughout ; proximal cloud of the fore wing much smaller, filling only about distal sixth of the median cell ; the clear part of the median cell is almost without setae (Text-fig. 112) ; apex of the fore wing without a dark cloud ; cheeks and temples more shiny and with a much more superficial sculpture ; punctation of the mesoscutum finer, the microsculpture and the punctures less contrasted ; coarse sculpture of the propodeum less abundant and restricted more or less to the middle line ; sides of propodeum hence more extensively smooth than in *trifasciatus* ; hind femur entirely black ; only the apical 2-3 segments of the hind tarsus pale ; face black ; ovipositor sheath a little longer, fully one and a quarter times longer than the hind tibia *orphne* sp. n.

FIJI Is. : Nadala, 11.x.1942, 1 ♀, the TYPE ; Lami, 19.iv.1945, 1 ♀, 1 ♂, labelled "on *Zea mays*", (*R. A. Lever*). Type in the British Museum (Nat. Hist.).

In this species, the 1st abscissa of the discoideus is almost as long as the 2nd ; in *trifasciatus* it is very distinctly shorter. Both species have the base of the radius distinctly indicated as a short, sclerotised stub. The relationship between the two species is close ; I can suggest no affinity with any particular section of the *ater*-group.

- 3 Mesoscutum with large punctures that are crowded on the anterior, declivous part but posteriorly become widely separated and on about posterior half tend to fade out completely, leaving the surface highly polished and strikingly bare ; edge of vannal lobe almost evenly convex throughout and with distinct hair-fringe ; propodeum along middle with large, rugulose trough ; towards the front, between this trough and the spiracle, the surface is highly polished ; propodeum a little longer than in the other species and with very prominent, posterior corners ; ovipositor sheath about one and a half times longer than the hind tibia.

Mesopleurum with long, wide, deep furrow that is distinctly rugulose ; length : ca. 2. 3 mm. without ovipositor *cyane* sp. n.

FIJI Is. : Suva, 19.xii.1939, 3 ♀♀, one the TYPE, 5 ♂♂, (*R. A. Lever*) ; Fiji, 1925, 1 ♀, ex *Agonoxena argaula* Meyrick, (*R. W. Paine*). Type in the British Museum (Nat. Hist.).

This is a much more slenderly built species than the others. The smooth parts of the body are polished and completely lack the satin-like sheen characteristic of the other species. The two clouds of the fore wing are much less well developed and both wings are narrower. The flagellum is imperceptibly thickened in about apical quarter and the two preapical segments are as long as wide.

²*Apanteles trifasciatus* Muesebeck, 1946 : 615.

- Mesoscutum quite differently sculptured ; the surface is closely punctate, with the punctures becoming a little less close posteriorly (but not to the same extent as in *orphne* and *trifasciatus*) ; further, the surface of the mesoscutum has a fine micro-sculpture and a satin-like sheen ; edge of vannal lobe straight and without a hair-fringe ; propodeum with a median, rugulose area that is slightly hollowed out but much less so than in *cyane* ; surface on each side of propodeum faintly dull, owing to fine microsculpture ; propodeum shorter than in *cyane* and like that of *trifasciatus* and *orphne* ; ovipositor sheath as long as the hind tibia ; ovipositor itself decidedly thick ; mesopleural furrow more shallow than in *cyane* ; dull and filled with extremely fine aciculation *eurynome* sp. n.

FIJI Is. : Viti Levu, 29.x.1954, 1 ♀, the TYPE, (B. A. O'Conner), labelled ? ex *Cryptophlebia pallifimbriana* Bradley (Olethreutidae) in fruits of *Inocarpus edulis*. Type in the British Museum (Nat. Hist.).

The faint proximal cloud of the fore wing hardly extends into the median cell ; the median cell has sparse setae situated over its entire surface but they are still sparser along the medius side of the cell ; the hind tarsus is only slightly longer than its tibia ; in this respect, *eurynome* differs from both *trifasciatus* and *orphne*. The antenna is short with the three preapical segments slightly transverse.

THE *ULTOR*-GROUP

Essentially characterized by the possession of three features, namely, (1) a sharp, very well defined punctation on the mesoscutum without a trace of longitudinal striation at the posterior end of the imaginary course of the notaulices, (2) a postero-lateral propodeal field that is always distinctly a little transverse and (3) a vannal lobe with an evenly convex edge that is fringed throughout with short hairs (Text-fig. 5). In addition, the following features should be noted:— tergite 1 is usually parallel-sided, sometimes slightly widened apically but never wedge-shaped as in many species of the superficially similar *ater*-group.

The group is rich in species in the tropics of the Old World and I know only of a few species from Europe including *ultor* Reinhard.³ It is more homogeneous than the equally abundant *ater*-group. These two groups together make up the bulk of Wilkinson's group S, into which he put all species having a well marked propodeal areola.

THE *NIGRICEPS*-GROUP

The few species that I consider to form this group are all American. The species are chiefly characterized by the curiously unpigmented cheeks, a very smooth-looking, virtually impunctate mesoscutum that is clothed rather densely with silky hairs, the form of the first tergite and the short, evenly sclerotised hypopygium. The group may later be shown to have no more value than that of a small segregate within the large *ater*-group to which it is, in any case, closely related.

The type of *Apanteles nigriceps* (Ashmead)⁴ is in the British Museum (Nat. Hist.).

³*Apanteles ultor* Reinhard, 1880 : 364.

⁴*Urogaster nigriceps* Ashmead, 1900 : 284

Apanteles nigriceps (Ashmead) Muesebeck, 1920 : 504.

THE *PARADOXUS*-GROUP

Monobasic.

Apanteles paradoxus Muesebeck

Apanteles paradoxus Muesebeck, 1958 : 446.

I know this species from two paratypes presented to the British Museum by Dr. Muesebeck.

In general habitus, this species might be taken for a typical member of the *glomeratus*-group. An areolated propodeum, however, is never found in this group. I am inclined to regard *paradoxus* as being related to certain elements in the *ultor*-group. For instance, *Apanteles expulsus* (*ultor*-group, Indo-oriental region) has an ovipositor almost as short as that of *paradoxus* but the rugose part of tergite (2 + 3) does not occupy the full width of the gaster as in that species and there are various subtle differences that certainly exclude the possibility of a close relationship.

Muesebeck thought that *paradoxus* showed some resemblance to *aletiae*, a North American species that I should have no hesitation in placing in the *ultor*-group though its position there would be marginal because of an extremely short ovipositor ; in general, species of the *ultor*-group have a freely exerted ovipositor.

COSTA RICA : San Sebastian (type locality).

Type in the U.S. National Museum.

Host : *Hemiceras* sp. (Notodontidae).

THE *CRASSICORNIS*-GROUP

My knowledge of this group is based on a male and female of *crassicornis* in the British Museum, determined by Muesebeck. Having only a limited acquaintance with the N. American fauna, I cannot say whether *crassicornis* (Provancher)⁵ and any allies it may have really form a discrete group or whether a transition exists towards the more typical members of the *ater*-group which seems to be well represented in the New World and to which *crassicornis* is very closely related. Nevertheless, attention needs to be drawn to this species because of its rostriform face (Text-fig. 116). I have not so far come across a lengthened head in the *ater*-group, except among the species of the *eublemmae*-subgroup, all S. African and far removed from the heavily sculptured *crassicornis*.

According to Muesebeck's 1920 key, two other N. American species, *banksi* Viereck and *dolichocephalus* Muesebeck, fall within the *crassicornis*-group.

N. AMERICA.

⁵*Microgaster crassicornis* Provancher, 1886 : 139, 142.

Apanteles crassicornis (Provancher) Provancher, 1888 : 388.

THE *SCHOENOBII*-GROUP

Monobasic.

Apanteles schoenobii Wilkinson*Apanteles schoenobii* Wilkinson, 1932a : 142

This is a remarkable species, quite unlike any other known to me except that it bears a curious, if fortuitous, resemblance to the N. American *terminalis* Gahan in general habitus.

The head is deep from back to front and is dull above with a satin-like sheen and an extremely fine, dense punctation. The very narrow apical margin of tergite (2 + 3)-6 is transparent and membranous (Text-fig. 346).

In the type female, the apical half of tergite (2 + 3) is yellow but in all other females I have seen, tergite (2 + 3) is entirely blackish. The apical half of this tergite, though quite differently sculptured from the basal half, is, nevertheless, finely roughened. The gaster bears a very fine, very dense pubescence. The ovipositor sheath is about as long as the hind tibia.

INDIA to the PHILIPPINES. Type locality : S. INDIA.

Type in the British Museum (Nat. Hist.).

Host : *Schoenobius bipunctiferus* Walker (Schoenobiidae) ; *Proceras polychrysa* Meyrick (Crambidae) ; *Diatraea* sp. (Crambidae).

THE *VIPIO*-GROUP

Monobasic.

Apanteles vipio Reinhard

Apanteles vipio Reinhard, 1880 : 365. [In key only].

Apanteles vipio Reinhard, 1881 : 44. [Description].

♀. Head from in front weakly elongate. Face, and more especially the clypeus, finely, very superficially punctate. Galea fully twice as long as wide ; glossa deeply forked. Scape of the antenna long, about twice as long as wide (Text-figs. 117 and 118). Mesoscutum highly polished. Propodeum strongly rugose, the rugae tending to radiate outwards from an irregularly defined medial keel. Vannal lobe beyond its widest part weakly convex and here with a trace of projecting hairs. Inner spur of the hind tibia fully three quarters as long as the hind basitarsus. Tergite 1 strongly, abruptly narrowed at apex ; deeply furrowed just where it turns over. Lateral, polished zone of scutellum not cutting off a parallel-sided groove. Ovipositor sheath about three fifths as long as the hind tibia. Length : ca. 3.5 mm. without ovipositor.

CENTRAL EUROPE.

Host : Reinhard records the single female known to him as having been bred from *Tinea* (now *Scythris*) *knochella* F. (Scythrididae).

This is a most distinctive species, without close allies known to me, and characterized very largely by the extremely short metacarp.

THE CAESAR-GROUP

Monobasic.

Apanteles caesar Wilkinson

Apanteles caesar Wilkinson, 1938b : 131.

♀. Hind tibia dull reddish, faintly darkened apically ; hind femur pale at tip.

Head in facial view markedly rostriform. Face shiny, impunctate. Tongue very long, almost as long as the combined segments of the labial palpus. Antennal scape very short (cf. *vipio*) (Text-fig. 119). Mesoscutum and propodeum highly polished. Lateral, polished zone of the scutellum pushed far forwards and cutting off between itself and the disc a long, narrow, rugose groove. Vannal lobe slightly concave beyond its widest part and here without trace of a hair-fringe. Tergite 1 strongly narrowed behind (Text-fig. 115). Ovipositor sheath nearly one and two thirds times longer than the hind tibia.

Length: ca. 4 mm. without ovipositor.

♂. Like the female except for the sexual differences.

S. W. AFRICA : Aus (type locality) ; Cape Province.

Type in the British Museum (Nat. Hist.).

With its rather large, dark brown wings, this species does not look like an *Apanteles* to the naked eye. It seems to be quite isolated. I do not look upon the lengthened mouth-parts as indicating a relationship with the European *vipio*.

The development of a rostriform face with or without a corresponding prolongation of the mouth-parts is extremely rare in *Apanteles* and apart from the few species introduced at couplet 16 of the key, turns up only within the rather loose aggregate of species that I have called the *ater*-group (*camirus* from S. Africa and a few related species), in the *crassicornis*-group from N. America and *lacteoides* of the *merula*-group.

THE LACTEUS-GROUP

Monobasic.

Apanteles lacteus (Nees)

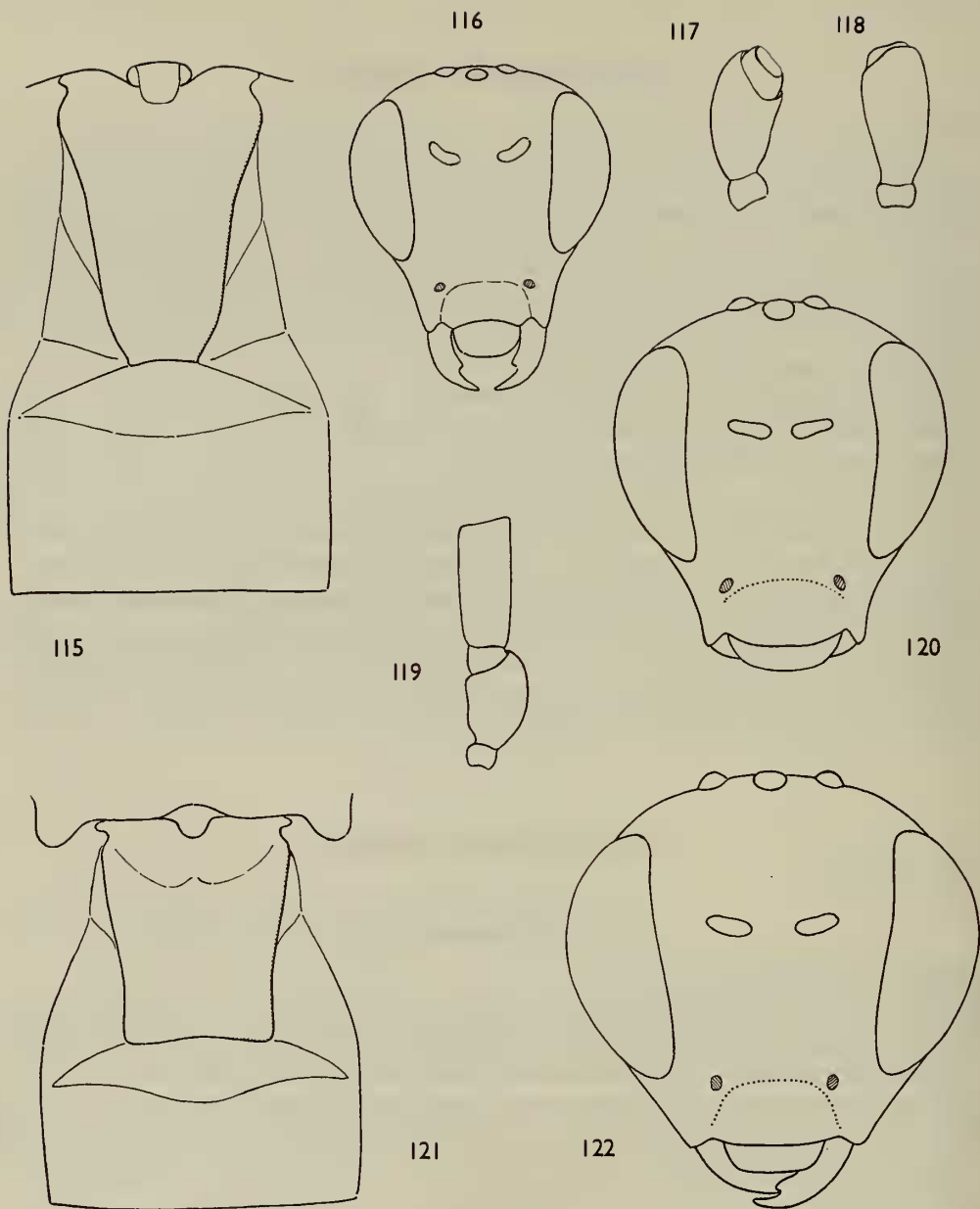
Microgaster lacteus Nees, 1834 : 187.

Apanteles lacteus (Nees) Reinhard, 1880 : 365. [not *lacteus* Nees, auctt.].

I have based my interpretation of this species on two females from the Reinhard collection and labelled in Reinhard's handwriting as "*lacteus* Nees".

♀. Hind femur entirely brown ; hind tibia yellowish on rather more than basal half. Wings milky-white ; nearly all the venation colourless. Hind spurs white. Labial palpi curiously darker than the maxillary palpi.

Head from in front markedly rostriform (Text-fig. 120). Mouth parts not lengthened. Face smooth-looking and with only a very faint punctation. Antenna short and of weak development ; the two preapical segments hardly one and half times longer than wide ; scape short. Mesoscutum somewhat dull, finely, closely punctate. Lateral, polished zone of scutellum pushed far forwards and cutting off between itself and the disc a long, narrow, parallel-sided furrow. Propodeum rugose all over middle part but with some punctation towards sides ; a few rugae radiating from the posterior orifice suggest a faintly indicated U-shaped areola. Hind



FIGS. 115-122. *Apanteles*, ♀: 115, *caesar* Wilkinson, basal tergites; 116, *crassicornis* (Provancher), head, from in front; 117 & 118, *vipio* Reinhard, scape; 119 *caesar* Wilkinson, basal three antennal segments; 120, *lacteus* (Nees), head, from in front; 121, *longipalpis* Reinhard, basal tergites; 122, *longipalpis* Reinhard, head, from in front.

spurs rather short, the inner one reaching to about the middle of the hind basitarsus. Tergite 1 short, subquadrate. Ovipositor sheath about one and half times longer than the hind tibia.

Length: ca. 3.5 mm. without ovipositor.

EUROPE. In addition to the Reinhard specimens, I have seen a series of 8 ♀♀, 1 ♂, from Finland, Tvärminne, *H. Lindberg* (Hellén Coll.).

Host: Recorded by Reinhard as having been bred singly from *Nephopteryx abietella* F., *Homoesa nimbella* Dupouchel and *Homoesa nebulella* Hübner (Crambidae).

Superficially, this species is very similar to *lacteoides* of the *merula*-group but differs at once in having no propodeal keel and in the very different shape of tergite 1.

THE *TERMINALIS*-GROUP

Monobasic.

Apanteles terminalis Gahan

Apanteles (*Pseudapanteles*) *terminalis* Gahan, 1912 : 2.

Apanteles terminalis Gahan ; Muesebeck, 1920 : 522.

♀. Two basal segments of the flagellum yellowish.

Propodeum very coarsely rugose, its posterior corners produced ; between these prominent posterior corners, the propodeum is markedly hollowed out to receive the base of the gaster. Fore wing narrow ; radius leaving stigma considerably distal to middle (Text-fig. 111) ; vannal lobe with long fringe of hairs throughout. Legs very slender, entirely yellow ; inner spur of the hind tibia hardly half as long as the hind basitarsus. Tergite 1 rectangular, longer than wide, turned over right at base and hence having prominent rounded shoulders anteriorly ; densely rugose all over. Ovipositor sheath slightly longer than the hind tibia.

Length: ca. 4 mm. without ovipositor.

N. AMERICA. One female, two males from Illinois in British Museum.

This highly aberrant species is apparently without close allies. In general habitus it has much in common with the Indo-oriental *schoenobii* but there are several significant differences such as the absence of propodeal areolation in *terminalis* and the difference in the position of the nervulus. Further, as in most species of *Apanteles*, *schoenobii* has the posterior tip of the scutellar disc smooth and polished.

THE *CAMMA*-GROUP

Monobasic.

I have established this group for a single species from S. Africa, noteworthy among other things for the pale banded antenna of the female.

Apanteles camma sp. n.

♀. A brownish-black, rather slenderly built species. Scape yellow-red. Hind coxa yellow.

Head large, distinctly wider than the mesoscutum, 6 : 5. Face shallowly punctate, the punctures large. Ocelli in a high triangle, the posterior, transverse tangent to the anterior ocellus passing far in front of the posterior pair. Flagellum very slender basally but becoming thicker towards apex, the two preapical segments hardly longer than wide ; the yellow band covers flagellar segments 6-7 and half of 8.

Mesoscutum and disc of scutellum somewhat dull, closely, rather coarsely punctate. The large, dorsal areas of the propodeum are dull, with a fine, somewhat glistening rugosity (Text-fig. 142). First abscissa of the radius much shorter than the transverse cubitus ; vannal lobe short and with long fringe of hairs throughout.

Tergite 1 fully one and a half times longer than wide, finely rugose, its horizontal part more or less parallel-sided and slightly longer than wide. Tergite 2 defined as such and occupying the full width of the gaster, rugose like tergite 1. Hypopygium angled at about 45 degrees as seen in profile, evenly sclerotised all over ; no trace of lateral creases. Ovipositor sheath a little shorter than the hind tibia.

Length: 2 mm. without ovipositor.

S. AFRICA : E. Cape Province, Katberg, 19-26.ii.1933, 2 ♀♀, one the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

This little species is highly aberrant and I have found no close allies. In general habitus, there is a resemblance to the species of the *ultor*-group. The hind spurs of this species are very weak, the inner one being only about one third as long as the hind basitarsus.

THE *INSOLENS*-GROUP

Monobasic.

Apanteles insolens Wilkinson

Apanteles insolens Wilkinson, 1930b : 276.

This is an isolated species characterized largely by the combination of bright red mesoscutum and the arrangement of keels on the propodeum.

♀. The amount of red on the thorax is variable but seems always to involve the pronotum and propleurum as well as the mesoscutum. The rest of the thorax is darkened with the propodeum becoming almost black. Head black. Hind femur entirely yellow.

Vertex and temples very strongly punctate. Ocelli in a rather low triangle, with the posterior, transverse tangent to the anterior ocellus just touching the posterior pair. Mesoscutum strongly, closely but discretely punctate all over. Propodeum (Text-fig. 148). Inner spur of the hind tibia just reaching middle of hind basitarsus. Vannal lobe beyond its widest part with sparse, projecting hairs.

Tergite 1 fully one and a half times longer than wide, rugose, very slightly narrowed behind (Text-fig. 148). Median field of tergite (2 + 3) weakly defined ; sometimes it shows medially a smooth, more or less circular swelling. Hypopygium weakly sclerotised, tightly folded in death and without lateral creases. Ovipositor (Text-fig. 147).

Length: ca. 2.5 mm.

S. AFRICA : Cape Province, Mossel Bay (type locality).

Type in the British Museum (Nat. Hist.).

This species shows a fortuitous resemblance to *camma* in the curious arrangement of the propodeal keels, though they produce a different pattern in the two species. In the absence of intergrading species I am not prepared to say that *insolens* is related to *camma*.

Wilkinson (1932 : 328) was well aware of the peculiarities of this species and placed it in a special group that he designated with the letter M.

THE *MLANJE*-GROUP

The essential feature of this group, which seems to be confined to Africa, is the structure of tergite (2 + 3), (Text-fig. 126, *mlanje* Wilkinson)⁶.

The side of the pronotum always shows a distinct dorsal furrow. The hypopygium is evenly sclerotised all over. The ovipositor is very short, more or less concealed.

The affinities of the group are obscure. In general habitus there is a strong resemblance to the *glomeratus*-group. On the other hand, certain species show an approach to the *octonarius*-group.

On the evidence of the material in the British Museum (Nat. Hist.), it seems that the species of the group are gregarious parasites.

De Saeger (1944 : 200) has described several species that clearly belong here.

THE *GLOMERATUS*-GROUP

This group is world-wide in distribution but particularly abundant in temperate regions. Its best known representative is *Apanteles glomeratus* (L.)⁷, a common parasite of *Pieris brassicae* L.

The group as defined here is not quite coextensive with Wilkinson's group F, for he included, not without some justification, a *mlanje*-subgroup and a *flavipes*-subgroup. I have given group status to *mlanje* and its allies and the *flavipes*-subgroup I consider to be merely aberrational within the larger *glomeratus*-group.

The species are very similar and difficult to separate. The hypopygium is evenly sclerotised and never shows lateral creases. The ovipositor is usually very short and more or less concealed ; rarely, it projects as a sharply pointed dagger correlated with a lengthened hypopygium (*acuminatus* Reinhard (Text-fig. 124) Europe) and I know of only one species in which it projects freely (*hyphanthiae* Riley, N. American but now introduced into Europe, Text-fig. 123).

The group contains both solitary and gregarious parasites.

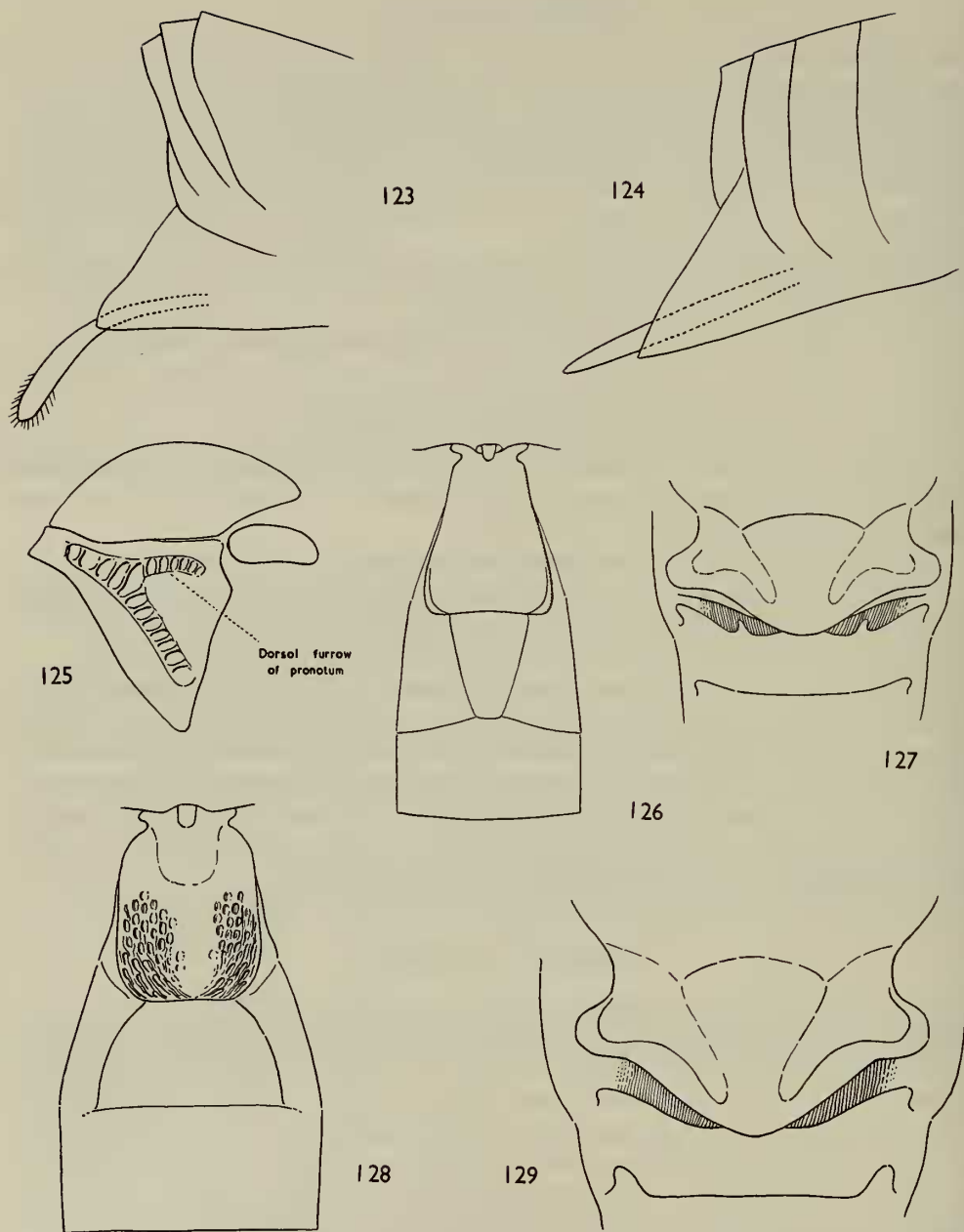
THE *POPULARIS*-GROUP

Species in general habitus closely resembling the *glomeratus*-group.

Pronotum with a dorsal furrow. Phragma of the scutellum clearly visible except in one species doubtfully included here (*chares*). Propodeum shining, smooth-looking and, compared with the *glomeratus*-group, with very little sculpture ; no trace of a transverse cristula on its anterior part, except in *endemus*. In all species, the 1st abscissa of the radius and the transverse cubitus are distinctly angled at their junction. The apical segment of the front tarsus with a distinct spine in the female (Text-fig. 144) ; apical segment of the hind tarsus with a corresponding modification though less well developed ; *parallelus* and *mandanis* are exceptional in both these respects ; hind spurs well developed, the inner one distinctly more than half as long as the hind basitarsus. Ovipositor more or less concealed.

⁶*Apanteles mlanje* Wilkinson, 1929c : 449.

⁷*Ichneumon glomeratus* L., 1758, *Systema naturae*, 10 : 568.



FIGS. 123-129. *Apanteles*, ♀: 123, *hyphantriae* Riley, ovipositor & hypopygium; 124, *acuminatus* Marshall, same. 125, *glomeratus* (L.), pronotum, lateral, to show dorsal furrow; 126, *mlanje* Wilkinson, basal tergites; 127, *exiguus* Haliday, to show anterior, paired projections of postscutellum; 128, *caberae* Marshall, basal tergites; 129, *vitripennis* (Haliday), to show phragma of scutellum, shaded.

EUROPE. N. AMERICA.

The curious structure of the apical segment of the front tarsus appears sporadically in a few other groups but seems to provide no index of close relationship. For instance, the females of certain species of the *mlanje*-, *vitripennis*- and *octonarius*-groups show a similar spine though it tends to be less well developed. It occurs also in species of the *formosus*-group, an aggregate that I consider to be rather far removed from any of the groups just mentioned.

The species of the *popularis*-group are difficult to separate. This is particularly true of *immunis* and *caberae* two species whose hosts appear to overlap, though this overlapping may be due to misidentification of lepidopterous larvae by collectors.

KEY TO SPECIES

FEMALES

- 1 Metacarp short, twice as long as the distance between its tip and the apex of the radial cell ; vannal lobe beyond its widest part with long, conspicuous hair-fringe.
 Spine of front tarsus 5 quite strongly developed but the segment with no emargination (Text-fig. 145) ; preapical segment of antenna about twice as long as wide ; mesoscutum shiny and with fine, superficial punctation ; propodeum with some sort of rugosity all over ; a distinct, transverse cristula present, in front of which lies a smooth, transverse area ; phragma of the scutellum virtually hidden ; hind femur black ; spines of the outer side of the hind tibia sparse and not differentiated into two kinds ; tergite 3 densely setose ***chares* sp. n.**
 ENGLAND: Herts, Chipperfield, 3.v.1942, 1 ♀, the TYPE, (R. B. Benson). Type in the British Museum (Nat. Hist.).
 This species can well be regarded as an aberrant member of the *glomeratus*-group.
- Metacarp longer, at least 3-4 times as long as its distance from the apex of the radial cell ; vannal lobe beyond its widest part with only an extremely short hair-fringe 2
- 2 Apical segment of the front tarsus without trace of a curved spine 3
- Apical segment of the front tarsus with a conspicuous curved spine.
 The segment anterior to the base of the spine deeply emarginate, except in *popularis* Hal. 4
- 3 Mesoscutum and scutellum somewhat dull by reason of a dense, sharp punctation ; ocelli not in a very low triangle, the transverse, posterior tangent to the anterior ocellus passing well in front of the posterior pair ; hair-fringe beyond widest part of vannal lobe with distance between hairs much less than length of hairs themselves ; tergite 1 with sharp, rather characteristic punctation on its turned over, apical part.
 Front and middle legs and the hind femur entirely yellow ; gaster richly marked with yellow, the areas outside the median field of tergite 2 and a large patch on each side of tergite 3 being yellow ; propodeum quite strongly rugose all over ***parallelus* Lyle⁸**
 ENGLAND. Type in the British Museum (Nat. Hist.).
 Host: *Hemithea strigata* Müller (Geometridae). Solitary parasite.
- Mesoscutum and scutellum highly polished and with only very superficial punctation ; ocelli in a lower triangle, the posterior tangent to the anterior ocellus cutting or, at any rate, touching the posterior pair ; hair-fringe of vannal lobe beyond its widest part much shorter, the distance between the hairs being about equal to the length of the hairs ; propodeum on anterior, horizontal part and more especially towards sides with elongate rugose-punctation ; but propodeum on the whole smooth and strongly shining.

⁸*Apanteles parallelus* Lyle, 1917 : 195.

Flagellum slightly thinner than in *parallelus*, the apical segments slightly more gradually diminishing in length ; front and middle coxae dark ; tergite 1 is slightly broader and more rounded behind than in *parallelus* in which species an apical constriction is hardly noticeable **mandanis** sp. n.

GERMANY (no locality), 3 ♀♀, one the *TYPE*, ex *Eustroma reticulata* (Cockayne), Sachsenwald, 2 ♀♀, 1 ♂, ex *Lygris reticulata* (Wagner). Type in the British Museum (Nat. Hist.).

Host: *Eustroma reticulata* F. (Geometridae).

In the available specimens the hind femur is pale with a darker flush along the upper surface.

- 4 Propodeum dull, densely rugose all over its medial part and with a very distinct, transverse keel behind the spiracle that extends inwards and partly sets off a postero-lateral area that is smoother and more shiny than the rest of the propodeum ; on its inner side this area completely lacks definition and merges into a median area of rugosity ; mesoscutum densely and rather sharply punctate ; horizontal part of tergite 1 rugose-punctate and with a sooty dull microsculpture superimposed on this ; median field of tergite 2 smooth-looking except for a satin-like sheen, subrectangular and with its lateral sulci extending as far as the 2nd suture.

Hind femur entirely reddish yellow in Scottish specimens ; faintly tipped with infuscation in the single female from France **endemus** sp. n.

SCOTLAND: St. Andrews, 18.vi.1936, 1 ♀, the *TYPE*; vi.1937, 1 ♂, 1 ♀, vi.1935, 2 ♀♀, 3 ♂♂, (*D. J. Jackson*). All bred as solitary parasites of *Abraxas grossulariata*. FRANCE: Finistère, Morlaix, 14.vi.1954, 1 ♀, (*J. F. Perkins*). Type in the British Museum (Nat. Hist.).

Host: *Abraxas grossulariata* L. (Geometridae).

The characteristic appearance of the apical part of tergite 1 is much less obvious in the males.

- Propodeum never with such extensive rugosity ; at most a rugose patch above the posterior orifice ; no trace of a keel behind the propodeal spiracle and no trace of a postero-lateral area ; if tergite 1 shows coarse rugose-punctuation then there is no dull superimposed microsculpture ; mesoscutum virtually impunctate or punctuation excessively fine ; if the median field of tergite 2 could be described as rectangular then it is completely rugose all over and the lateral sulci are incomplete 5
- 5 Sulci of tergite 2 incomplete, directed towards the lateral margin of the segment and hence not completely defining a median field ; the median field tends to be rectangular rather than triangular 7
- Sulci of tergite 2 complete, directed towards the second suture and defining a triangular or subtriangular field 6
- 6 Median field of tergite 2 tending to be smooth-looking except for a dull, satin-like sheen ; tergite 1 less rugose.

Gaster beneath sometimes richly marked with yellow ; hind femur usually bright reddish-yellow ; the furrow that limits the median field of tergite 2 behind is wide and somewhat characteristically interrupted at middle ; flagellum long with the preapical segment fully twice as long as wide. Easily confused with *immunis* but the median field of tergite 2 less transverse (Text-fig. 128) **caberae** Marshall⁹

EUROPE. Type of *caberae* Marshall⁹ and of *jugosus* Lyle⁹ in British Museum (Nat. Hist.).

Host: *Amphidasis betulae* L., *Bupalus piniarius* L. *Ennomos fuscantaria* Haworth, *Cabera exanthemata* Scopoli (Geometridae).

- Median field of tergite 2 with rugose-striation except at base and along middle, lacking this satin-like sheen ; tergite 1 more rugose.

⁹*Apanteles caberae* Marshall, 1885 : 212.

Syn. *Apanteles jugosus* Lyle, 1916 : 270. **Syn. n.**

Legs coloured as in *caberae* but the pale parts straw-yellow rather than reddish yellow ; propodeum dull and more or less rugose all over, the rugosity denser above the posterior orifice ; spine of front apical tarsal segment less well developed than in *caberae* ***paleacritae*** Riley¹⁰

N. AMERICA. One female only, named by Muesebeck, in the British Museum (Nat. Hist.).

Host: Muesebeck (1920) records the following hosts: *Nyctobia anguilineata* Grote and Robinson, *Alsophila pometaria* Harris, *Cosymbia lumenaria* Hübner (Geometridae).

The above taxonomic information should be accepted with caution since I have seen only one specimen of this species, with broken antennae.

- 7 Spine of front tarsal segment 5 very weak and almost straight (Text-fig. 146) ; the segment anterior to the base of the spine without an emargination.

Very black species with the hind femur always black ; tergite 1 more rounded behind than in *immunis*, smoother and more shiny than in that species ; metacarp shorter in relation to its distance from the apex of the radial cell than in *immunis*

popularis (Haliday)¹¹

ENGLAND.

Host: *Tyrea jacobaeae* L. (Arctiinae). As far as I know, the only gregarious species of the group. Single-brooded.

- Spine of front tarsal segment 5 strong, conspicuously curved ; segment anterior to the base of the spine deeply emarginate.

Hind femur nearly always reddish yellow ; median field of tergite 2 tending to occupy the whole of the surface of the tergite and with short, deep, incomplete sulci directed towards the middle of the side of the segment ; further, the median field is rugose all over and lacks definition at its posterior corners 8

- 8 Cheeks with a conspicuous white blotch ; tergite 1 tending to be widened posteriorly and with the sculpture of its horizontal part a little more dense and intricate ; inner spur of the hind tibia slightly longer ***enephes*** sp. n.

ENGLAND: Essex, Epping Forest, 1 ♀, the TYPE, ex *Ennomos dolabraria*, (T. R. Eagles).

SWEDEN: Oland, Råpplinge, 1 ♀, 4.vi.1955, ex *Erannis defoliaria*, (Johansson). Type in the British Museum (Nat. Hist.).

Host: *Ennomos dolabraria* L., *Erannis defoliaria* Clerck (Geometridae).

- Cheeks without a white blotch ; tergite 1 rarely a little widened posteriorly, its sculpture slightly more shiny and coarsely rugose-punctate ; inner spur of the hind tibia relatively a little shorter than in *enephes*.

Hind femur varying from entirely reddish yellow to infusate with paler, medial or lateral flush ; rarely entirely black ; sculpture of propodeum variable in intensity ; sometimes there is considerable rugosity above the orifice, this rugosity giving way to diffuse punctation anteriorly ***immunis*** (Haliday)¹²

BRITISH IS. SWEDEN.

Host: *Operophthera brumata* L., *Hibernia defoliaria* Clerck, *Cabera pusaria* L., *Cidaria corylata* Thunberg, *Campaea margaritata* L. (Geometridae) ; *Hypena proboscidalis* L. (Plusiidae).

¹⁰*Apanteles paleacritae* Riley, 1882 : 313.

¹¹*Microgaster popularis* Haliday, 1834 : 250.

Apanteles popularis (Haliday) Marshall, 1885 : 213.

¹²*Microgaster immunis* Haliday, 1834 : 250.

Apanteles immunis (Haliday) Marshall, 1885 : 212.

THE *PISTRINARIAE*-GROUP

Monobasic.

Apanteles pistrinariae Wilkinson

Apanteles pistrinariae Wilkinson, 1929c : 443.

This species is remarkable because of the medial constriction of the plate of tergite 1 (Text-fig. 113). The hypopygium is large, strongly developed and clothed with long bristle-like hairs (Text-fig. 113).

AFRICA : Nigeria (type locality) ; Nyasaland ; Eritrea.

Type in the British Museum (Nat. Hist.).

Host : A gregarious parasite of *Mylothris chloris* F. (Pieridae).

I consider this species to have a close affinity with the *glomeratus*-group.

THE *SIDERION*-GROUP

The characters of this group have been summed up in couplets 29 and 30 of the key (p.22). The dense fringe of hairs on the inner side of the apical margin of the hind tibia needs to be looked for carefully. In certain lights the hairs making up the fringe are faintly iridescent.

KEY TO SPECIES

FEMALES

- 1 Hind coxa dark brown ; median field of tergite 2 very narrow with its base distinctly shorter than its sides ; this tergite whitish except for a small, brown, wedge-shaped mark against each side of the median field.

Antenna not at all thickened towards apex ; segment 15 discontinuously longer than 16 and fully twice as long as wide ; face rather strongly punctate ; mesoscutum strongly sharply punctate, the punctures well separated and larger than in the other species ; scutellar disc more convex than in the other species, its extreme posterior tip raised as seen in profile ; the furrow between scutellum and mesoscutum deeper and more strongly costate than in the other species ; transverse keel of propodeum situated far anterior to middle, forking laterally to enclose the spiracle ; posterior to the transverse keel, the propodeum shows much coarse rugosity ; front and middle coxae whitish ; hind tibia darker than the reddish flushed femur and like the hind tarsus, almost blackish ; middle and front femur yellow ; temples with sharp, distinct punctuation. Length: ca. 2.6 mm.

sagmaria sp. n.

PHILIPPINES: Mdro. Or., Mt. Halcon, 3,100 ft., 10.v.1954, 1 ♀, the TYPE ; 4,500 ft., 11.v.1954, 1 ♂, Negros, Mt. Canalaon, 4,700 ft., 1.v.1953, 1 ♂, (*M. & D. Townes*). Type in Coll. Townes.

- Hind coxa entirely yellow ; median field of tergite 2 less narrow, its base fully as long as its sides ; temples smooth-looking, with only faintly indicated punctuation ; tergite 2 more extensively darkened 2
- 2 Tergite 1 with sides constricted beyond widest part so that posteriorly it appears almost stalked (Text-fig. 134) ; median field of tergite 2 very distinctly triangular 3
- Tergite 1 lacking this constricted appearance and gradually narrowed from base to apex ; median field of tergite 2 subrectangular (Text-fig. 132).

Face sharply punctate, the punctures of medium size; antenna long, rather thick, with the preapical segment almost twice as long as wide; mesoscutum densely, rather finely punctate; propodeum with irregular transverse keel, situated far in front and laterally more or less forking to enclose the spiracle; hind tibia brown, contrasting with the yellow hind femur; palpi whitish with middle and front coxae almost as pale; claws larger than in the other species; hypopygium short. *vafer* sp. n.

PHILIPPINES: Mdro. Or., Mt. Halcon, 4,500 ft., 11.v.1954, 1 ♀, the TYPE, 3,000–4,500 ft., 10.–11.v.1954, 14 ♂♂, (*M. & D. Townes*). Type in Coll. Townes.

Extremely like the two following species and readily separable only on the shape of the basal tergites.

- 3 Tergite 1 slightly more constricted apically, its broadened apical part reddish and contrasting with the darker apical part (Text-fig. 134); flagellum imperceptibly thickened towards apex; abscissa 1 of the discoideus less distinctly shorter than 2

siderion sp. n.

JAVA: Tjibodas, 5,000–7,000 ft., viii.1913, 1 ♀, the TYPE, (*Koningsberger*). Type in the British Museum (Nat. Hist.).

- Tergite 1 slightly less constricted apically, its broadened basal part not noticeably paler than the rest of the tergite; flagellum not thus apically thickened (difference between the two species slight on this character); abscissa 1 of the discoideus more distinctly shorter than 2; hypopygium much more strongly developed than in *siderion* with the ovipositor slightly longer (Text-fig. 137).

atylana sp. n.

JAVA: Tjibodas, 5,000–7,000 ft., viii.1913, 1 ♀, the TYPE, (*Koningsberger*).

Type in the British Museum (Nat. Hist.).

THE MEROPE-GROUP

Claws lobed with a short excision between the lobe and the short apex of the claw (Text-fig. 143); in comparison with the *siderion*-group, the hind tibia is very bristly, the hind tarsus is shorter and has its ventral flange deeper and altogether more noticeable; the apical segment of the front tarsus shows a feeble, curved spine near the apex (Text-fig. 143) (weakest in *phoebe*). Tergite 2 with a large, clearly delimited subtriangular field with base longer than sides.

In spite of their both possessing a hind tibial fringe, it seems that this group and the *siderion*-group are not very closely related. Apart from the differences already pointed out, species of the *merope*-group have the ocelli in a lower triangle with the transverse, posterior tangent to the anterior ocellus cutting the posterior pair. In the *siderion*-group, this tangent hardly touches the posterior ocelli.

KEY TO SPECIES

FEMALES

- 1 Eyes very large so that the shortest distance between an eye and a posterior ocellus is hardly as great as the longer diameter of the ocellus; 1st abscissa of the discoideus distinctly shorter than the 2nd (Text-fig. 149).

Face densely, irregularly pitted; flagellum thick but attenuated towards apex and with the preapical segment about twice as long as wide; temples coarsely, contiguously, almost rugosely punctate; anterior half of the mesoscutum with a satin-like sheen as well as a very strong, sharply discrete punctuation; hind femur only very slightly infusate apically; median field of tergite 2 brown, rather sharply triangular; ovipositor strongly downcurved (Text-fig. 139).

merope sp. n.

BORNEO: Sandakan, 1 ♀, the *TYPE*, (*Baker*). Type in the U.S. National Museum.

The propodeum shows more rugosity than in the next two species but the short, oblique keel that lies posterior to the spiracle is less well developed.

- Eyes much less large, this distance much greater than the longer diameter of the posterior ocellus; 1st abscissa of the discoideus hardly shorter than the 2nd.

Ovipositor much less downcurved than in *merope* and the hypopygium more strongly developed and angularly produced (Text-fig. 138)

- 2 Median field of tergite 2 yellow, shorter, less triangular, more transverse; temples with strong, sharp, contiguous punctation; face very coarsely, deeply punctate.

Hind tibia deeply infusate on about apical two thirds; outer face of the hind femur densely, strongly punctate; in the other two species, this punctation is weaker and more confused; apex of gaster (Text-fig. 138); antennae broken

penelope sp. n.

BORNEO: Sandakan, 1 ♀, the *TYPE*, (*Baker*). Type in the U.S. National Museum.

Perhaps not more than subspecifically distinct from the following species.

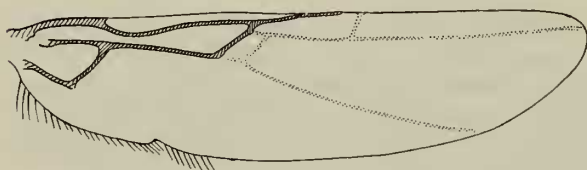
- Median field of tergite 2 brown, longer, more obviously triangular, less transverse; temples with much weaker punctation; hind tibia as in *penelope*; face less strongly punctate.

Antenna as in *merope* with the preapical segment almost twice as long as wide

phoebe sp. n.

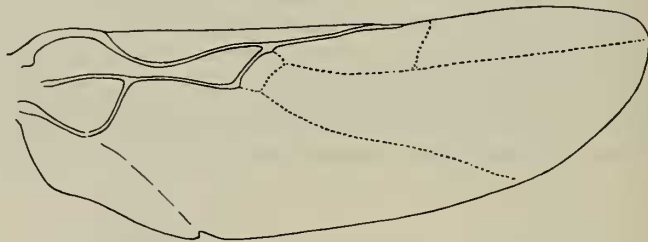
MALAYA: (Penang I.); 1 ♀, the *TYPE*, (*Baker*); I. of Basilan, 1 ♀, (*Baker*). Type in the U.S. National Museum.

I ascribe also to this species 4 ♂♂ (PHILIPPINES: Luzon, Mt. Makiling); these have the temples virtually impunctate. The propodeum of *phoebe* is more extensively smooth than in *penelope*.



130

131



FIGS. 130-131. Hind wing of *Apanteles*: 130, *annulicornis* (Ashmead), ♀; 131, *alfalfae* Nixon, ♂.

THE ANNULICORNIS-GROUP

The essential characters of this group have been given in the key. The metacarp is very long in comparison with its distance from the apex of the radial cell and almost closes this. The two species I include in the group are closely and naturally related.

The yellow-banded flagellum of *annulicornis* (Ashmead) is a rare feature of

Apanteles and I have found it elsewhere only in the S. African group of *camma*, the Indo-oriental group of *taeniaticornis* and the Fijian group of *trifasciatus*. The *taeniaticornis*-group has a certain affinity with *annulicornis* but this cannot be said of *camma*, which is an aberrant and isolated species.

KEY TO SPECIES

FEMALES

- 1 Body entirely fulvous, except for a darker head ; antenna with a bright yellow band covering flagellar segments 6-8 ; vannal lobe not at all concave beyond its widest part and with distinct hair-fringe throughout ; cubitellian cell about twice as high as long on the radiella ; (Text-fig. 130) ; tergite 1 longer, narrower, less abruptly narrowed posteriorly ; legs relatively longer ; hind tarsus and apex of hind tibia less contrastingly darkened ; ovipositor a little longer, thicker, more curved ; eyes larger

annulicornis (Ashmead)¹³

W. INDIES. Type in the British Museum (Nat. Hist.).

Most distinct on account of the yellow-banded antenna of the female. The antenna is slightly thickened apically with segments 14-17 more or less square in outline. It is probable that *A. lipomeringis* Muesebeck, (1958) is related to this species.

- At least the propodeal area and the dorsum of the gaster infuscated ; antenna without a yellow band, slightly shorter than the body, not at all thickened towards apex and with segments 14-17 distinctly longer than wide ; vannal lobe slightly concave beyond its widest part and here without trace of a fringe ; cubitellian cell much higher than long on the radiella, so short, in fact, as to be easily overlooked ; tergite 1 shorter, very abruptly narrowed posteriorly, with its medial channel more sharply defined and extending almost onto the posterior, horizontal surface ; legs of a clearer yellow colour than in *annulicornis* with the hind tarsus and the apex of the hind tibia more contrastingly darkened ; ovipositor slightly shorter and thinner, less curved ; eyes smaller *ruficollis* (Cameron)¹⁴

BRITISH GUIANA. Type in the British Museum (Nat. Hist.).

Host: Recorded by Cameron as having been bred from the Pyralid, *Zinckenia* (now *Hymenia*) *fascialis* Stoll.

The material in the British Museum (Nat. Hist.) is represented by 4 ♀♀ and 4 ♂♂, mounted together on one card ; hence, possibly a gregarious parasite. The species is most distinct on account of the slit-like cubitellian cell. The male is entirely brown and in both sexes the stigma is almost colourless. The stigma is entirely dark in *annulicornis* and the ocelli are slightly larger and closer together than in *ruficollis*.

Wilkinson (1930:154) incorrectly synonymised *brunneus* Ashmead under *annulicornis*. *A. brunneus* has the cubitellian cell of the hind wing considerably wider than high and thus lacks the salient feature of the *annulicornis*-group. It is closely related to *nerion* of the *nerion*-group but since the type (in British Museum (Nat. Hist.)) is a male, there is nothing at this stage that I can more usefully say about it.

¹³*Pseudapanteles annulicornis* Ashmead, 1900 : 292.

Apanteles annulicornis (Ashmead) Muesebeck, 1920 : 525.

¹⁴*Xanthomicrogaster ruficollis* Cameron, 1911 : 325.

Apanteles ruficollis (Cameron) Wilkinson, 1930b : 281.

THE *NERION*-GROUP

I am by no means sure that the species I have included in this group form a natural aggregate. The two S. American species, in spite of having a long cubitellan cell in the hind wing, have probably a closer relationship with the two species of the *annulicornis*-group than with the two Philippine species with which I have associated them.

KEY TO SPECIES

FEMALES

- 1 Mesoscutum, except for faint anterior darkening, reddish ; tergite 1 much less conspicuously narrowed behind and hence not markedly wedge-shaped (Text-fig. 135).
 Mesoscutum with fine, dense, but not very sharp punctation ; fore wing of ordinary form and with very long metacarp that almost reaches the apex of the radial cell ; 1st abscissa of the discoideus not at all longer than the 2nd ; vannal lobe beyond its widest part with almost concave edge and with virtually no projecting hairs ; legs stoutish with the inner spur of the hind tibia reaching slightly beyond the middle of the hind basitarsus ; hind coxa dusky yellow ; hind femur and hind tibia bright yellow except for the darkened tip of the tibia ; spines of the outer side of the hind tibia all of one kind, rather weak and not very numerous ; propodeum short, anteriorly with vague indication of punctation and without acute posterior corners ; ovipositor sheath about three quarters as long as hind tibia . *abantidas* sp. n.
 BRAZIL: Nova Teutonia, 12.vii.1937, 1 ♀, the TYPE, (Plaumann). Type in the British Museum (Nat. Hist.).

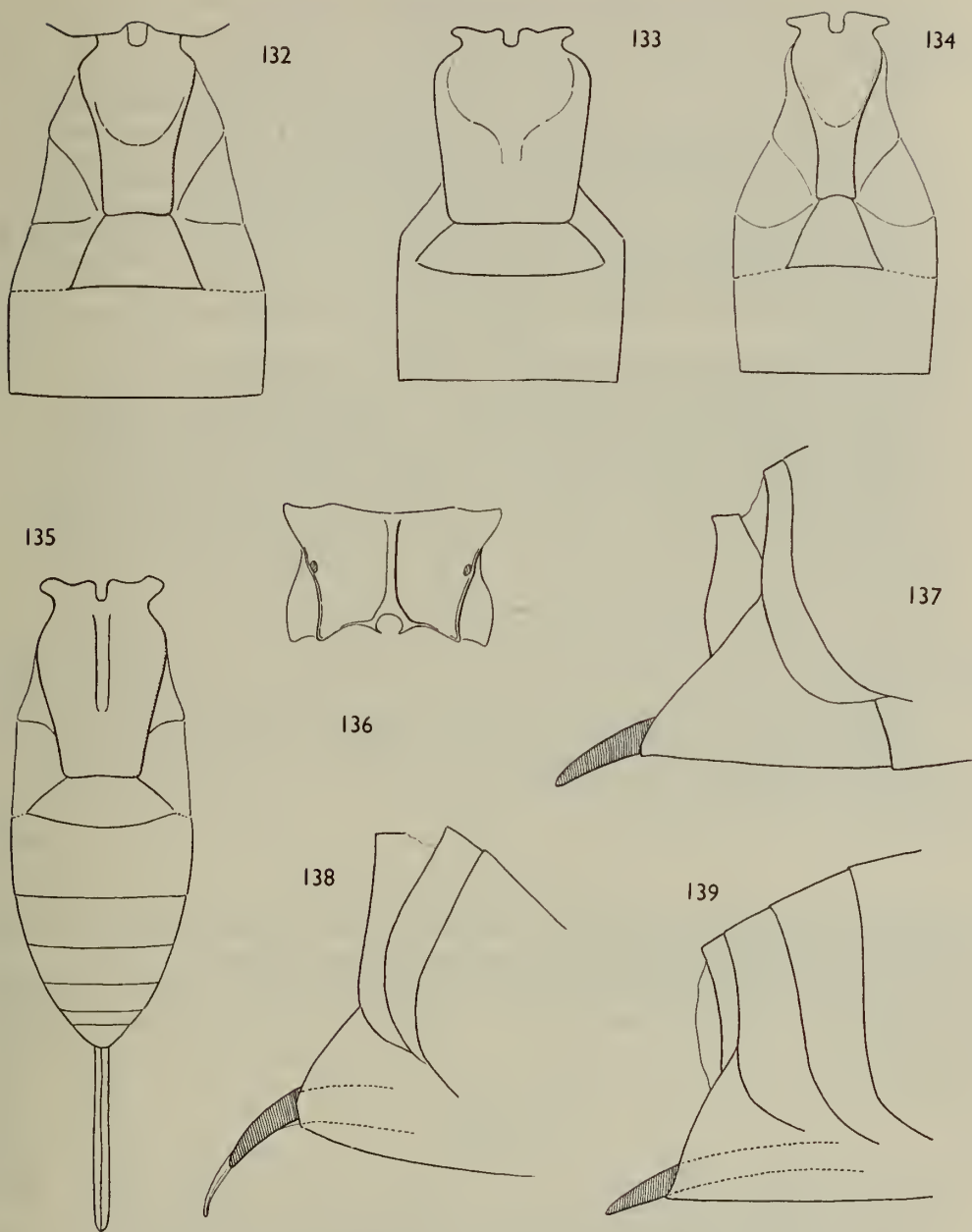
This species approaches the *sesiae*-group much more closely than the other species, its cubitellan cell being the shortest occurring in the group.

- Mesoscutum blackish ; tergite 1 conspicuously narrowed behind and markedly wedge-shaped.
 Spines of the outer side of the hind tibia distinctly of two kinds and more numerous 2
- 2 Tergite 1 turned over slightly posterior to middle and conspicuously, longitudinally grooved on its anterior, declivous part ; 1st abscissa of the discoideus distinctly longer than the 2nd ; hind coxa and hind femur bright orange yellow ; inner spur of the hind tibia extending considerably beyond the middle of the hind basitarsus ; ovipositor sheath as long as the hind tibia.
 Ocelli smaller than in the following two species and further apart, the transverse, posterior tangent to the anterior ocellus not touching the other pair ; fore wing somewhat narrow ; metacarp relatively shorter than in the next two species ; propodeum slightly longer, and somewhat excavate on each side posteriorly, with acute posterior corners, as seen from above (Text-fig. 136) ; length: 2.2 mm. without ovipositor *nerion* sp. n.
 BRAZIL: Nova Teutonia, 26.iv.1938, 1 ♀, the TYPE, (Plaumann). Type in the British Museum (Nat. Hist.).

Antenna thin, not longer than the body and with segments 14-17 about one and a half times longer than wide. As might be expected, this species approaches *annulicornis* more closely than it does the Old World species and its inclusion in a different group is somewhat unnatural.

- Tergite 1 turned over slightly anterior to middle and without a medial channel on its anterior part though it may be shallowly furrowed here ; 1st abscissa of the discoideus not at all longer than the 2nd ; hind coxa and hind femur dark brown to blackish ; inner spur of the hind tibia shorter, not extending beyond the middle of the hind basitarsus ; ovipositor sheath very obviously longer than the hind tibia.

Species with the ocelli closer together than in *nerion*, the transverse, posterior tan-



FIGS. 132-139. *Apanteles*, ♀: 132, *vafer* sp. n., basal tergites; 133, *moerens* sp. n., same; 134, *siderion* sp. n., same; 135, *abantidas* sp. n., gaster, dorsal; 136, *nerion* sp. n., propodeum; 137, *atylana* sp. n., ovipositor & hypopygium; 138, *penelope* sp. n., same; 139, *merope* sp. n., same.

- gent to the anterior ocellus virtually touching the posterior pair ; posterior, horizontal surface of tergite 1 very obviously rugose 3
- 3 Hind tibia almost black with the spurs contrasting white ; inner spur of the hind tibia slightly longer ; flagellum with slightly longer pubescence and not in the least paler apically ; pubescence of mesopleurum towards middle coxa and of metapleurum paler, longer and conspicuous ; ovipositor straight and downcurved at extreme tip ; a distinct stub at the junction of the 1st abscissa of the radius and the transverse cubitus ; occiput with distinct, iridescent shimmer ; horizontal part of tergite 1 with more longitudinal elements in its sculpture but the sculpture less heavy than in the next species *venilia* sp. n.

PHILIPPINES: Negros Or., Mt. Canlaon, 3,600 ft. iv. 1953, 1 ♀, the *TYPE*, (M. & D. Townes). Type in Coll. Townes.

The pubescence of the wings is rather long, very dark and somewhat a feature of the species.

- Hind tibia dark brown with basal fifth sharply pallid ; hind spurs yellowish ; inner spur of the hind tibia shorter, weaker, not reaching beyond the middle of the hind basitarsus ; flagellum with shorter pubescence ; antenna distinctly paler towards extreme tip, the more apical segments more closely articulated, shorter, 16-17 being about one and one third times longer than wide ; pubescence of mesopleurum towards middle coxa and of metapleurum much less conspicuous ; not at all characteristic as in *venilia* ; no trace of a stub at the junction of the 1st abscissa of the radius and the transverse cubitus ; occiput without an iridescent shimmer ; horizontal part of tergite 1 with a more even, though still shiny, rugosity in which longitudinal elements are absent (only one specimen seen!) ; pubescence of wings normal ; ovipositor curved downwards towards apex but not in the least abruptly *daphne* sp. n.

PHILIPPINES: Mindanao, Iligan, 1 ♀, the *TYPE*, (Baker). Type in the U.S. National Museum.

The vannal lobe has a straight edge beyond its widest part and has at most an occasional projecting hair ; in *venilia*, this edge is very slightly convex but like *daphne* is virtually without projecting hairs.

THE *SESIAE*-GROUP

This is another small group with longitudinally keeled propodeum and widely exerted ovipositor. The two included species are very different.

The American species of *Apanteles* with keeled propodeum need a good deal more study before their interrelationships at the species-group level can be more clearly defined.

KEY TO SPECIES

FEMALES

- 1 Body entirely bright fulvous except for a little infuscation along the posterior margin of the scutellum and of post-scutellum and along the medial keel of the propodeum ; ovipositor sheath only slightly longer than the hind tibia, more or less straight in profile ; vannal lobe beyond its widest part with straight edge and here with an occasional minute, projecting hair.

Ocelli close together, the distance between the anterior ocellus and a posterior ocellus very obviously less than the diameter of the ocellus ; mesoscutum strongly shining and with only traces of superficial punctation ; tergite 1 hardly narrowed

behind and about one and a half times longer than its apical width ; basal field of tergite 2 very strongly transverse, about five times wider than long (Text-fig. 133)

moerens sp. n.

BRAZIL: Nova Teutonia, 16.ix.1935, 1 ♀, the TYPE, (Plaumann). Type in the British Museum (Nat. Hist.).

- Body brownish black with the gaster paler beyond tergite 2 and yellowish on basal half beneath ; ovipositor sheath about one and one third times longer than the hind tibia, in profile strongly curved ; vannal lobe beyond its widest part with slightly concave edge and here without trace of projecting hairs.

Ocelli a little further apart ; mesoscutum with a rather more distinct punctuation though still very superficial, the surface very shiny ; tergite 1 distinctly narrowed behind, about twice as long as its apical width ; basal field of tergite 2 longer, three times as wide as long but still obviously rectangular *sesiae* Viereck¹⁵

N. AMERICA. Type in U.S. National Museum.

Host: *Sesia scitula* Harris (Aegeriidae). My interpretation of this species is based on a specimen in the British Museum determined by Muesebeck.

The propodeum is slightly more rounded than in *moerens* and its posterior corners less pointed and not at all produced as in that species. The spines of the outer side of the hind tibia are very fine and obsolescent on posterior two thirds ; in *moerens* they are of equal development throughout and slightly denser and more prickly on basal two thirds.

THE *CIRCUMSCRIPTUS*-GROUP

Wilkinson dealt very thoroughly with *circumscriptus* (Nees)¹⁶ in 1938, associating with it a long synonymy of other species on the evidence of type- or neo-type material. It is probable that he incorrectly synonymised certain species under *circumscriptus* (Nees). I intend to take up this matter at a latter date.

Wilkinson (1938 : 50) expressed a strong doubt as to whether *circumscriptus* belonged to his own group A. My own view is that this species is rather far removed from all elements in group A, the greater part of which I have now split into a *vitripennis*- and an *octonarius*-group.

Although I have, in the key, referred to the ovipositor sheath as being at most about two thirds as long as the hind tibia, it is also never very short. Nor is it ever partly hidden as in most species of the *vitripennis*- and *octonarius*-groups. Figure 156 gives a clear idea of how the ovipositor appears in relation to the gaster in the majority of the species.

The following points are necessary for the recognition of the group: Mesoscutum with a curious, dull, satin-like sheen. Postscutellum with a small, lateral, forwards pointing projection (Text fig. 127) ; such a projection never occurs in either of the groups mentioned above. Spines of the outer side of the hind tibia very sparse and weak (Text-fig. 153).

The group is small and the few species known to me are parasites of *Elachista* and *Stephensia* (Elachistidae) and *Lithocolletis* and *Gracillaria* (Gracillariidae).

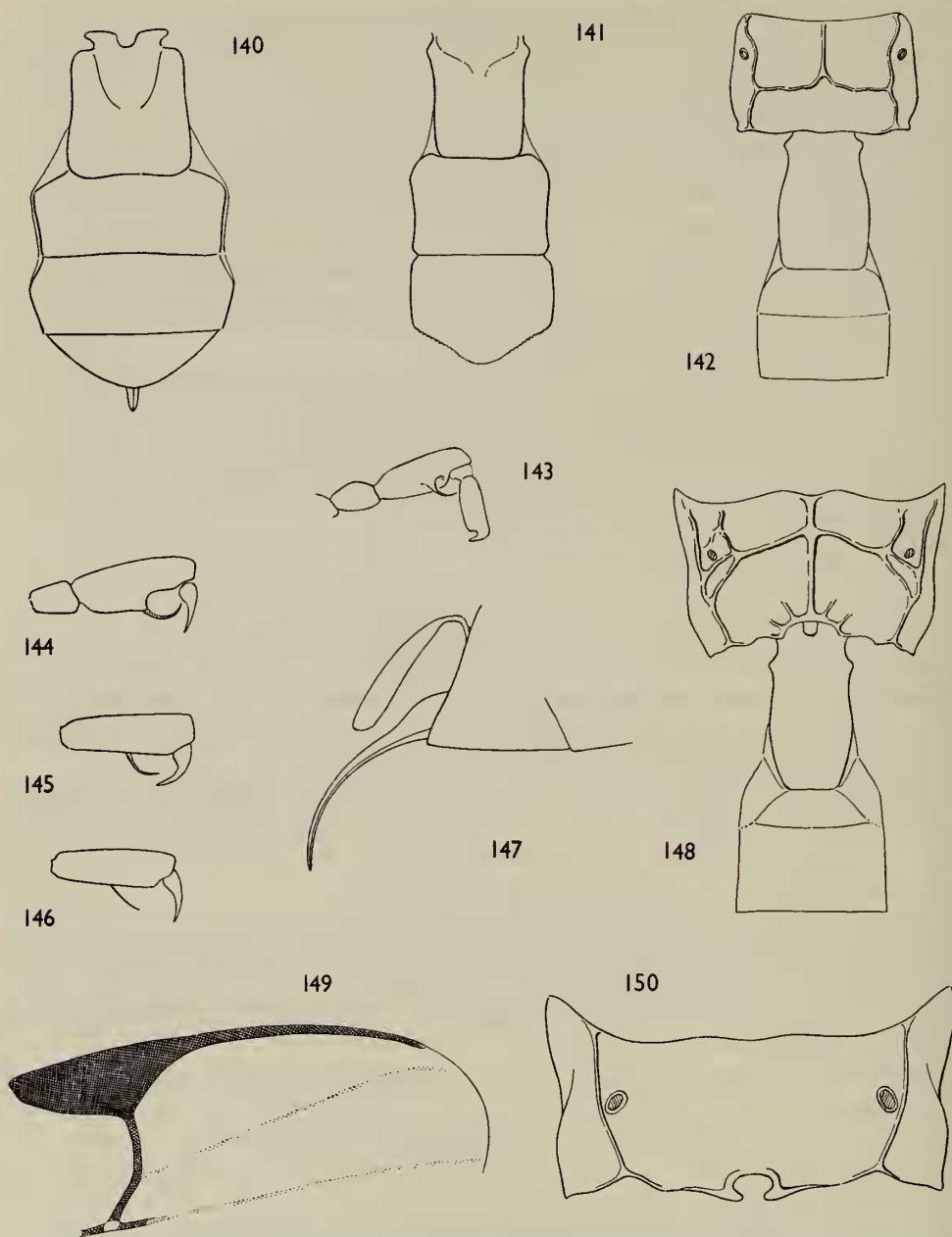
¹⁵ *Apanteles* (*Pseudapanteles*) *sesiae* Viereck, 1912 : 146.

Apanteles sesiae Viereck ; Muesebeck, 1920 : 525.

¹⁶ *Microgaster circumscriptus* Nees, 1834 : 181.

Apanteles circumscriptus (Nees) Reinhard, 1881 : 48.

Apanteles circumscriptus (Nees) ; Wilkinson, 1938 : 41.



FIGS. 140-150. *Apanteles*, ♀: 140, *carbonarius* (Wesmael), gaster, dorsal; 141, *patro* sp. n., same; 142, *camma* sp. n., propodeum & basal tergites; 143, *merope* sp. n., segment 5 of front tarsus and claw; 144, *caberae* Marshall, segment 5 of front tarsus; 145, *chares* sp. n., same; 146, *popularis* (Haliday), same; 147, *insolens* Wilkinson, ovipositor & hypopygium; 148, *insolens* W., propodeum and basal tergites; 149, *merope* sp. n., fore wing, part; *formosus* (Wesmael), propodeum.

Among the N. American species of *Apanteles* in the British Museum (Nat. Hist.) are two, *bedelliae* Viereck and *ornigis* Weed, both determined by Muesebeck, that clearly belong to the *circumscriptus*-group.

THE *CARBONARIUS*-GROUP

Although differing from it widely in the form of the basal tergites, *carbonarius* and its allies are, in my opinion, closely related to the *circumscriptus*-group. The enlargement of tergite (2 + 3) to form a rugose carapace occurs in almost every subfamily of the Braconidae and taxonomically has little value above the generic level.

The characters emphasised in the discussion under the *circumscriptus*-group occur also in the *carbonarius*-group. Very characteristic of the latter is that the gaster is distinctly notched at the position of the 2nd suture (Text-fig. 140). The cubitellian cell of the hind wing is very long, fully twice as long as wide. Ovipositor very short, almost concealed.

The presence of a representative of the group in the Philippines is noteworthy and in need of clarification.

KEY TO SPECIES

FEMALES

- 1 Tergite (2 + 3) enlarged to form a coarsely rugose carapace that completely hides the more apical segments ; posterior margin of this carapace finely crenulate laterally (Text-fig. 141).

Mesoscutum shiny, closely, rather strongly punctate for the size of the insect ; hind coxa and underside of gaster bright yellow ; propodeum polished and with strong medial keel ; length: 1.8 mm.

patro sp. n.

PHILIPPINES: Luzon, Mt. Makiling, 1 ♀, the TYPE, (Baker). Type in U.S. National Museum.

I think I am correct in believing this little species to be related to *carbonarius*. Its extreme development of the gaster is unique in *Apanteles* and is reminiscent of such hormiine genera as *Aulosaphes* Muesebeck and *Cedria* Wilkinson.

- Tergite (2 + 3) not thus enlarged, the more apical segments exposed ; tergite (2 + 3) forms a large rugose segment notched at the position of the 2nd suture but its posterior margin is membranous and normal ; hind coxa black ; *carbonarius*-group s.str. 2
- 2 Tergite 1 large, coarsely rugose, hardly one and a half times longer than wide ; propodeum with much coarse rugosity in spite of being very shiny

carbonarius (Wesmael)¹⁷

EUROPE. Bred in England from *Bucculatrix nigricomella* Zeller and *B. cristatella* Zeller (Lyonetiidae). Type in the Musée royale d'Histoire naturelle, Brussels.

- Tergite 1 smaller, more finely rugose and fully twice as long as wide ; propodeum polished, except for the medial keel *comes* Wilkinson¹⁸

¹⁷ *Microgaster carbonarius* Wesmael, 1837 : 47.

Apanteles carbonarius (Wesmael) Reinhard, 1880 : 363.

Apanteles carbonarius (Wesmael) ; Wilkinson, 1940 : 157.

¹⁸ *Apanteles comes* Wilkinson, 1940 : 161.

ENGLAND. Type in the British Museum (Nat. Hist.).

Host: *Bucculatrix cristatella* Zeller (Lyonetiidae) (Kent, Dartford).

This species has the mesoscutum virtually impunctate while in *carbonarius* it is distinctly punctate.

THE *BUCCULATRICIS*-GROUP

Monobasic.

Apanteles bucculatricis Muesebeck

Apanteles bucculatricis Muesebeck, 1920 : 502.

There are in the British Museum collection one female determined as *bucculatricis* by Muesebeck (California, Berkeley) and labelled as " parasitic on *Bucculatrix albertiella* Bank " and two males presumably sent to London at the same time as the female but without Muesebeck's identification label ; these are from California, Palo Alto, labelled as bred from *Bucculatrix* sp. on *Quercus agrifolia* and are evidently part of the type series.

Muesebeck noted that this species differed from all others of the genus known to him in possessing a very large areola and in having tergite 1 and (2 + 3) enlarged, coarsely rugose and occupying almost the entire surface of the gaster.

In general appearance, the gaster of this species is remarkably like that of *carbonarius* but the difference in the structure of the propodeum is fundamental and, in my opinion, excludes the probability of a close relationship between the two species. Far more likely is an affinity with the *ultor*-group, for *bucculatricis* possesses the three essential features of this group, namely, an obviously, if rather finely, punctate mesoscutum, transverse, postero-lateral, propodeal areas and a vannal lobe that is convex and fringed with hairs throughout. Among the species of the *ultor*-group, *hemitheae* Wilkinson (1928) from the Indo-oriental region shows a structural and sculptural development of the gaster very similar to that of *bucculatricis*, though in other respects the two species are widely dissimilar.

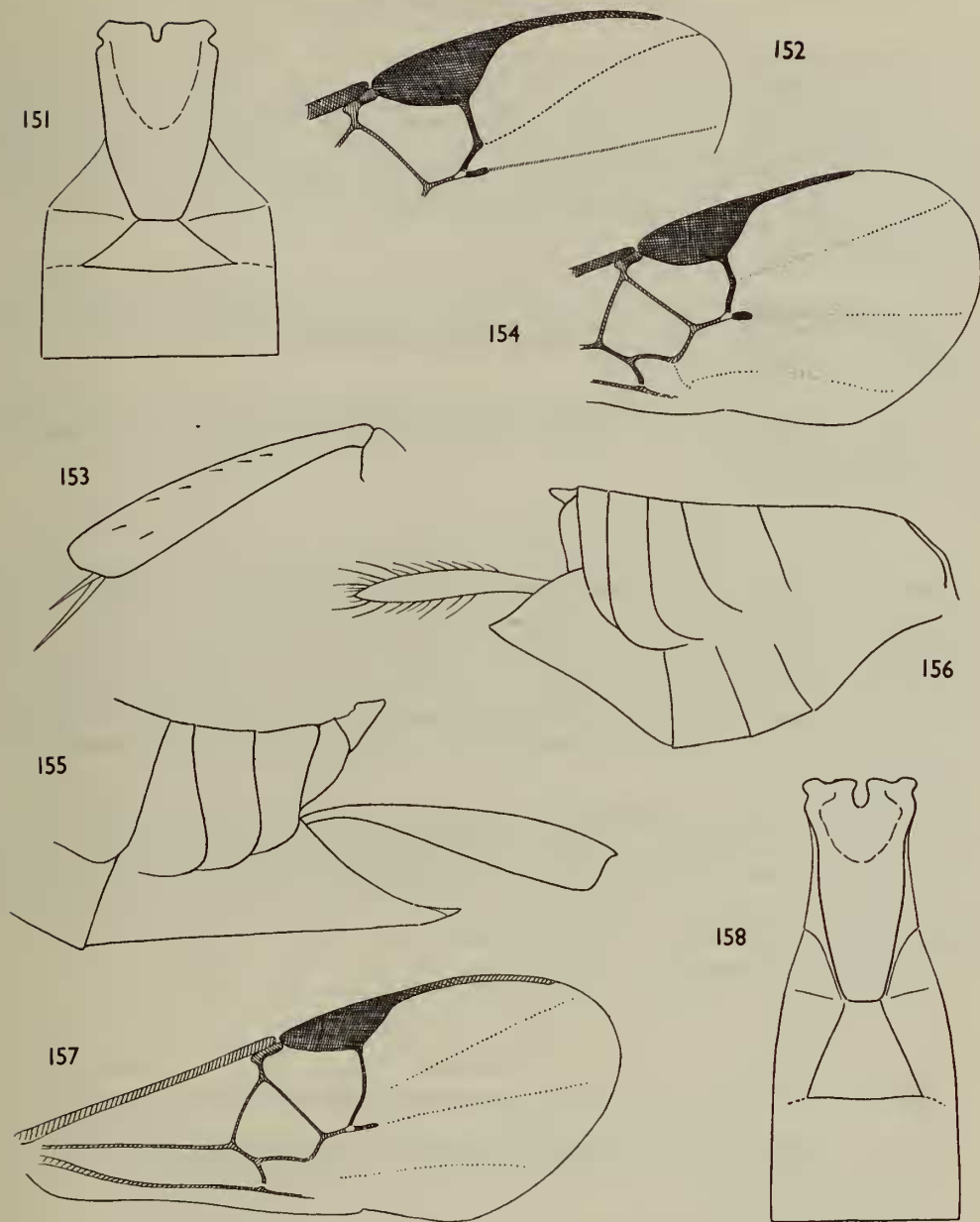
The finding of other American species related to *bucculatricis*, if such occur, would doubtless help to define its correct systematic position within *Apanteles*.

THE *METACARPALIS*-GROUP

The species I group together under this heading seem to be rather closely related to the *circumscriptus*-group but beyond this and what has already been expressed in the key, there is little I am prepared to say about them at this stage. *A. metacarpalis*, the typical representative of the group, is a fairly common species, at any rate in England.

I am acquainted with less than a dozen European species that I would put in this group, among them *corvinus* Reinhard (Wilkinson, 1945) and *coniferae* Haliday (Wilkinson, 1945).

I also consider as belonging to this group, *dioryctriae* Wilkinson (1938) and *murinanae* Capek & Zwölfer (1957).



FIGS. 151-158. *Apanteles*, ♀: 151, *metacarpalis* Thomson, basal tergites; 152, *vitripennis* (Haliday), fore wing, part; 153, *circumscriptus* (Nees), hind tibia, to show paucity of spines; 154, *metacarpalis* Th., fore wing, part; 155, *metacarpalis* Th., ovipositor & hypopygium; 156, *circumscriptus* (Nees), gaster, lateral; 157, *octonarius* (Ratzeburg), fore wing; 158, *vitripennis* (Haliday), basal tergites.

- Propodeum without trace of a keel though strong rugae may be crowded around the posterior orifice 4
- 4 Ovipositor in lateral view evenly curved, rather thick, and without trace of an apical sinuation (Text-fig. 170) ; lateral, polished zone of the scutellum with smooth, almost rounded posterior margin ; tergite 1 not very strongly narrowed behind, dull, evenly rugose. India *camilla* sp. n. (p. 165)
- Ovipositor in lateral view straight, thin, and with conspicuous, apical sinuation ; lateral, polished zone with its posterior margin forming a raised, ridge-like edge ; tergite 1 strongly narrowed behind, smooth, with punctures along sides. Africa *typhon* sp. n. (p. 153)
- 5 Head in facial view markedly triangular, with face shining, impunctate (Text-fig. 167).
Mesoscutum shiny and with a very fine punctation ; ovipositor sheath slightly more than one and a half times longer than the hind tibia. Europe *lacteoides* sp. n. (p. 160)
- Head in facial view not at all triangular ; face less shining 6
- 6 Metacarp very short, hardly one and a half times longer than its distance from the apex of the radial cell.
Ovipositor short, evenly curved, rather thick, its sheaths about as long as the hind tibia. India *detrectans* Wilkinson (p. 158)
- Metacarp at least twice as long as its distance from the apex of the radial cell 7
- 7 Ovipositor sheath at most about one and one third times as long as the hind tibia ; nervellus virtually straight so that the submediellan cell is not or hardly lobed outwards at the vannal lobe corner (Text-fig. 159).
Ovipositor slightly but more or less evenly curved throughout and without an apical sinuation 8
- Ovipositor sheath nearer to twice as long as the hind tibia ; nervellus distinctly curved outwards at its junction with the mediella so that the submediellan cell is distinctly lobed at the vannal lobe corner (Text-fig. 160). 9
- 8 Mesoscutum strongly shining and polished with only a very superficial punctation ; preapical segment of the antenna not longer than wide ; ovipositor sheath about one and one third times longer than wide ; metacarp a little more than twice as long as its distance from the apex of the radial cell. Europe *isus* sp. n. (p. 159)
- Mesoscutum less shining and less polished, its punctation more distinct ; preapical segment of the antenna distinctly longer than wide ; metacarp fully three times as long as its distance from the apex of the radial cell ; ovipositor sheath hardly longer than the hind tibia. Europe *aeolus* sp. n. (p. 161)
- 9 Ovipositor in lateral view distinctly sinuate at apex (Text-fig. 169) ; flagellum decidedly thickened towards base and its segments with an upstanding, bristly pubescence. Africa *apidanus* sp. n. (p. 162)
- Ovipositor in lateral view without trace of such a sinuation ; flagellum not noticeably thickened towards base, its segments with a pubescence so short as to be hardly noticeable 10
- 10 Ovipositor virtually straight but somewhat abruptly down-curved at apex ; punctation of mesoscutum slightly sharper and more discrete, with less evidence of fine microsculpture. India *cajani* Wilkinson (p. 161)
- Ovipositor slightly but more or less evenly curved throughout ; punctation of mesoscutum less discrete ; surface duller and with clear indication of fine microsculpture. Europe *myeloenta* Wilkinson (p. 162)
- 11 Ovipositor evenly curved throughout, its sheaths at most one and a quarter times longer than the hind tibia ; in lateral view, the apex of the ovipositor never shows a sinuation but frequently is abruptly attenuated here, the narrowed part being about as long as segment 4 of the hind tarsus 12

- Ovipositor straight for most of its length, its sheaths about twice as long as the hind tibia ; in lateral view, the ovipositor is deeply sinuate at apex (Text-fig. 168).
Propodeum without a longitudinal keel but with strong rugosity surrounding the posterior orifice ; metacarp fully five times as long as its distance from the apex of the radial cell ; radial cell markedly downcurved at apex. Australia
briareus sp. n. (p. 153)
- 12 Hind coxa and hind femur yellow ; basal half of gaster dull red ; lower side of flagellum (antenna being stretched forwards) with unusually long pubescence, the longest hairs being fully equal to two thirds the width of the segments ; inner spur of the middle legs reaching almost to apex of second tarsal segment.
Legs entirely yellow except for the darkened apex of the hind tibia and the entirely dark hind tarsus. Africa *hebrus* sp. n. (p. 156)
- At least the hind coxa black ; basal half of gaster blackish ; lower side of flagellum without such long pubescence ; inner spur of the middle legs not reaching beyond apex of basal segment of tarsus 13
- 13 Propodeum without trace of a median, longitudinal keel but with some strong rugae extending upwards from the posterior orifice 14
- Propodeum always with a distinct, median longitudinal keel (sometimes the keel is double, except anteriorly).
Ovipositor with an apical attenuation 15
- 14 Hind legs, distal to coxae, predominantly reddish-yellow ; cubitellian cell of the hind wing higher than wide ; temples shiny and with only feeble punctation. Malaya
melpomene sp. n. (p. 155)
- Hind legs, distal to coxae, predominantly blackish with the hind tibia and hind basitarsus both sharply yellowish-white on basal half ; cubitellian cell slightly wider than high ; temples dull and with strong contiguous punctation. Ceylon
prusias sp. n. (p. 155)
- 15 Mesoscutum dull, with a fine, glistening rugosity in which there is virtually no trace of punctation ; disc of scutellum also dull, with a fine, rugulose-aciculate sculpture.
Metacarp three and a half to four times as long as its distance from the apex of the radial cell. Africa *pyrene* sp. n. (p. 157)
- Mesoscutum either smooth, shining, or with a clearly punctate sculpture that becomes irresolvable only sometimes along course of notaulices 16
- 16 Propodeum, especially across brow, dull, densely, almost coarsely rugose.
Posterior corners of the propodeum rather raised, the surface between them and the very strong medial keel subvertical, slightly hollowed out and covered with some sort of coarse rugosity ; preapical segment of the antenna hardly longer than wide. Europe *vindicus* sp. n. (p. 157)
- Propodeum much more finely sculptured, in greater part smooth and polished and, if more sculptured, then the sculpture of the brow fine and more or less even 17
- 17 Horizontal part of tergite 1 dull, strongly rugose all over (more so than in any other species of the group) ; wings markedly brownish.
Mesoscutum somewhat dull, but sharply punctate. Africa *lynceus* sp. n. (p. 157)
- Horizontal part of tergite 1 without such strong sculpture, at most with fine micro-sculpture and scattered punctures, more especially where it turns over ; wings hyaline 18
- 18 Mesoscutum highly polished, impunctate ; metacarp about one and a half times longer than its distance from the apex of the radial cell.
Distance between the posterior ocelli much greater than the distance between one of them and the eye-margin. Australia *alfalfae* Nixon (p. 163)
- Mesoscutum somewhat dull, finely and quite distinctly punctate ; metacarp at least about twice as long as its distance from the apex of the radial cell 19

- 19 Metacarp fully five times as long as its distance from the apex of the radial cell ; 1st abscissa of the discoideus not longer than the nervulus and forming with it a straight, colourless vein (Text-fig. 175).
Distance between the posterior ocelli very distinctly shorter than the distance between one of them and the eye-margin. Malaya . . . *jason* sp. n. (p. 162)
- Metacarp at most about three and a quarter times longer than its distance from the apex of the radial cell ; 1st abscissa of the discoideus very distinctly longer than the nervulus and not forming with it a straight colourless vein. 20
- 20 Metacarp about two and a half times longer than its distance from the apex of the radial cell ; segments 16–17 of the antenna hardly longer than wide. Europe
merula Reinhard (p. 159)
- Metacarp about three and a quarter times longer than its distance from the apex of the radial cell ; antenna slightly longer, segments 16–17 being about one and one third times longer than wide. Europe *meruloides* sp. n. (p. 160)

Apanteles typhon sp. n.

♀. Hind tibia becoming faintly paler towards basal third ; hind tarsus dark throughout.

Face dull, finely punctate. Head in a facial view more or less circular. Temples dull, finely, sharply punctate. Distance between the posterior ocelli very slightly less than the distance between one of them and the eye-margin, 8:9. Preapical segment of the antenna hardly one and a quarter times longer than wide ; pubescence of flagellum hardly noticeable.

Mesoscutum finely, densely, evenly punctate and somewhat dull. Disc of scutellum finely, closely punctate. Spines of the upper part of the outer side of the hind tibia dense and somewhat overlapping. Nervellus of the hind wing virtually straight where it meets the submediella. Propodeum in greater part almost smooth.

Horizontal part of tergite 1 polished medially, punctate along sides. Ovipositor sheath about one and one third times longer than the hind tibia (this measurement taken from the female from Nelspruit ; sheaths absent in type) ; ovipositor straight except an apical sinuation, like that of *briareus* (cf. Text-fig. 168).

Length: ca. 3 mm. without ovipositor.

AFRICA : Togoland, Kreosu, i.1925, 1 ♀, the *TYPE*, labelled “ pest of cotton ”, (G. S. Cotterell) ; S. Africa : Nelspruit, 3 ♀♀, 2 ♂♂, ex larva of false codling moth, (? *Argyroplote leucotreta* Meyrick).

Type in the British Museum (Nat. Hist.).

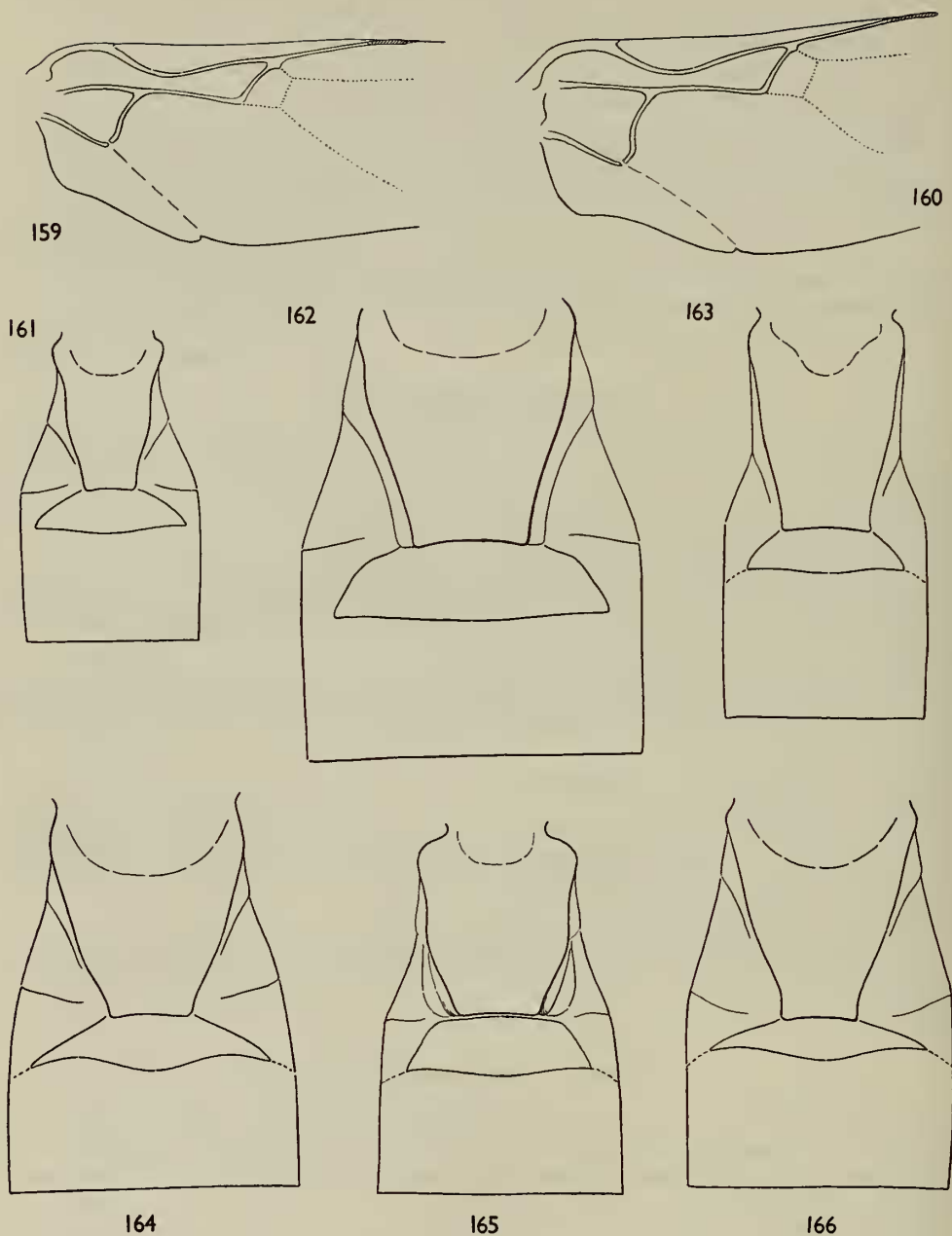
Essentially characterized by the absence of a propodeal keel and the sinuate apex of ovipositor. A similar sinuation is equally well developed in the Australian *briareus*.

Apanteles briareus sp. n.

♀. Hind tibia blackish on apical half ; proximally becoming first faintly reddish and then, on basal quarter, bright yellow ; hind tarsus blackish, except that the basal segment is yellow at extreme base ; the single female from the New Hebrides has the hind tibia entirely blackened except for yellow basal fifth. Stigma evenly dark brown.

Head rather small relative to the size of the thorax ; in a facial view not in the least subtriangular ; very shiny, indistinctly punctate. Temples shiny, faintly roughened. Distance between the posterior ocelli equal to the distance between one of them and the eye-margin. Antenna long, powerful, with the preapical segment almost twice as long as wide.

Mesoscutum shiny, but very sharply, discretely and distinctly punctate. Disc of scutellum with a few punctures along sides. Propodeum without trace of a keel ; punctate anteriorly but



FIGS. 159-166. *Apanteles*, ♀: 159, *isus* sp. n., hind wing, part; 160, *myeloenta* Wilkinson, same; 161-166. Basal tergites of, 161, *detrectans* Wilkinson; 162, *briareus* sp. n.; 163, *cajani* Wilkinson; 164, *aeolus* sp. n.; 165, *tedanius* sp. n.; 166, *alfalfae* Nixon.

with numerous, coarse rugae on posterior, declivous part. Stigma somewhat narrow; 1st abscissa of the radius and the transverse cubitus forming a long, evenly curved vein as in *jason* (cf. Text-fig. 175); submedian cell with only a few setae towards apex; setae of the median cell long, sparse, widely absent along medius side of cell; abscissa 1 of the discoideus hardly longer than the nervulus and distinctly shorter than abscissa 2; hind wing very broad. Outer side of hind tibia densely spinose.

Median field of tergite (2 + 3) subrectangular, its lateral corners not very acutely angled (Text-fig. 162).

Length: ca. 4.8 mm. without ovipositor.

AUSTRALIA: Brisbane, 8.iii.1957, 1 ♀, the *TYPE*, bred from *Arotrophora ambrodelta*, (*G. Ettershank*). NEW HEBRIDES: Malekula, i.1930, 1 ♀, (*L. E. Cheesman*).

Type in the British Museum (Nat. Hist.).

Host: *Arotrophora ambrodelta* Low (Tortricidae).

This is a fine, very distinct species, aberrant and not to be confused with any other species dealt with in this synopsis.

Apanteles prusias sp. n.

♀. Another species without trace of a longitudinal keel on the propodeum, having many of the characters of *briareus* but an ovipositor of different structure. There are other big differences.

Middle tibia whitish yellow on basal half, blackish on apical half; hind tibia like middle tibia, the pale basal half in sharp contrast with the blackened apical half; almost basal half of hind basitarsus yellowish; segments 3–5 of the hind tarsus reddish, paler than the dark half of the basitarsus. Wings strongly embrowned; stigma evenly dark brown and all venation pigmented.

Face punctate, the punctures large but rather indistinct. Antenna about as long as the body but broken; segment 15 not longer than wide. Distance between the posterior ocelli slightly shorter than the distance between one of them and the eye-margin.

Mesoscutum densely, discretely punctate, the punctures sharp and rather large. Disc of scutellum with sharp, scattered punctures almost all over. Propodeum with strong rugae radiating upwards from the orifice and tending to define vaguely the limits of an areola. Median and submedian cell densely setose (cf. *briareus*); metacarp fully six times as long as its distance from the apex of the radial cell; abscissa 1 of the discoideus only slightly longer than the nervulus but distinctly a little shorter than abscissa 2; hind wing rather narrow; cubitellian cell not higher than wide. Spines of the upper part of outer side of hind tibia fire-red; those on lower part whitish; outer, upper face of hind coxa closely, coarsely punctate.

Median field of tergite (2 + 3) with acutely drawn out lateral angles. Ovipositor sheath hardly as long as the hind tibia; ovipositor simple.

Length: ca. 3.2 mm. without ovipositor.

CEYLON: Madulsima, 8.xii.1908, 1 ♀, the *TYPE*, (*T. B. Fletcher*).

Type in the British Museum (Nat. Hist.).

Aberrant within the *lacteus*-group, differing from *briareus* in appearance of wings as well as structure of ovipositor. In many respects, *prusias* resembles the following species but there are big differences.

Apanteles melpomene sp. n.

♀. A species without trace of a longitudinal propodeal keel and with an ovipositor similar to that of *prusias*, with which species it may be compared as follows:

Legs, apart from the coxae, entirely bright reddish yellow with the front and middle tarsi almost whitish and the hind tibia becoming whitish on about basal third. Wings virtually clear hyaline; venation pigmented throughout; stigma dark brown.

Face strongly, coarsely punctate; in places almost longitudinally striate-punctate. Head considerably less transverse than in *prusias* but showing a resemblance to that of *briareus*. Antenna broken but evidently longer and thicker than in *prusias* with segment 15 fully twice as long as wide; this is a big difference between the two species.

Mesoscutum characteristically punctate as in *prusias* but the surface more shiny and the punctures less close; the surface is distinctly impressed along the course of the notaulices and here, instead of the punctures being closer and more crowded as usually happens, they tend to become smaller and fade out on posterior half of mesoscutum. Disc of scutellum with hardly a trace of punctation. Propodeum exactly as in *prusias*. Hind coxa considerably larger than in *prusias* with the outer, upper face more shiny and with much weaker punctation; hind tarsus more bristly. Abscissa 1 of the radius much longer in proportion to the length of the transverse cubitus; the disposition of the veins is altogether more like that of *briareus* than *prusias*; median cell and submedian cell as densely setose as in *prusias* but the setae longer; cubitellian cell of the hind wing higher than wide; hind wing considerably broader.

Horizontal part of tergite 1 with coarse punctures and rugosity right across. Ovipositor sheaths fully as long as the hind tibia.

Length: 4.2 mm. without ovipositor.

MALAYA: Trengganu, Jerangau Estate, 2 ♀♀, one the *TYPE*, bred 21.xii.1955, from cocoon of *Conopia* sp. (Aegeriidae).

Type in the British Museum (Nat. Hist.).

Apart from the S. African *hebrus*, no other species in the *merula*-group has the legs so brightly coloured. Altogether, this is a most distinctive species and probably transitional between the *merula*- and *grandiculus*-groups.

Apanteles hebrus sp. n.

♀. The middle and front legs of this brightly coloured species are somewhat whitish-yellow.

Face appearing slightly roughened owing to presence of fine, raised points. Antenna about as long as the body, tapering apically with the preapical segment about one and one third times longer than wide. Distance between the posterior ocelli equal to the distance between one of them and the eye-margin.

Mesoscutum shiny, with an indistinct, very superficial punctation. Disc of scutellum polished, virtually impunctate. Propodeum, in contrast, dull, with a satin-like sheen and fine microsculpture; a few, large punctures across the brow; median keel percurrent, distinct. Abscissa 1 of the discoideus distinctly a little longer than 2; metacarp fully six times as long as its distance from the apex of the radial cell; cubitellian cell of the hind wing a little wider than high. Hind tarsus, in profile, tapering somewhat apically and having a densely bristly appearance; inner spur of the hind tibia very powerful, about three quarters as long as the hind basitarsus.

Tergites 1 and (2 + 3), (Text-fig. 176). Ovipositor sheath about three quarters as long as the hind tibia; ovipositor evenly curved throughout and without an apical attenuation.

Length: ca. 2.5 mm. without ovipositor.

♂. It is with confidence that I associate two males with the type female. The wings are a little darker than those of the female. The antenna, apart from the normal sexual differences, shows the same long hairs beneath the flagellum. The hind coxa is entirely brown in one example but yellow beneath in the other.

S. AFRICA: Pondoland, Port St. John, 1-5.iv.1923, 1 ♀, the *TYPE*, 25-31.iii.1923, 2 ♂♂, (*R. E. Turner*).

Type in the British Museum (Nat. Hist.).

This is an aberrant species, far removed from the other species with keeled propodeum. In addition to the long spurs of the middle and hind legs, the polished, lateral zone of the scutellum lacks the raised posterior edge typical of the *lacteus*-group.

In all the other species of the group, the longer spur of the middle tibia does not reach beyond the apex of the middle basitarsus.

Apanteles pyrene sp. n.

♀. Hind leg blackish throughout, except for the basal quarter of the hind tibia which is obscurely whitish. Stigma evenly dark brown.

Face finely roughened and with a satin-like sheen. Antenna as long as the body with the preapical segment one and one third times longer than wide. Vertex between the ocelli and the temples finely roughened and dull. Distance between the posterior ocelli slightly greater than the distance between one of them and the eye-margin.

Propodeum dull, for the most part; finely, evenly rugose with punctures across brow but becoming smoother and polished towards posterior corners.

Median field of tergite (2 + 3) very small, with long drawn-out lateral angles and with a row of punctures across apical margin.

Length: ca. 2.5 mm. without ovipositor.

S. AFRICA: Cape Province, Mossel Bay, vi-vii.1930, 1 ♀, the *TYPE*, 15.iii.-30.iv.1932, 2 ♀♀, v.1930, 1 ♀, v.1937, 1 ♀, (*R. E. Turner*).

Type in the British Museum (Nat. Hist.).

Species characterized by the sculpture of the mesoscutum and of the disc of the scutellum.

Apanteles lynceus sp. n.

♀. Hind leg entirely blackish, except that the base of the hind tibia (about a quarter) is whitish-yellow. Wings faintly smoky with the venation fully pigmented and the stigma evenly dark brown.

Face shiny, distinctly but rather superficially punctate. Distance between the posterior ocelli equal to the distance between one of them and the eye-margin. Antenna shorter than the body; the four preapical segments almost square in outline.

Punctures of the mesoscutum slightly larger and slightly more crowded along the course of the notaulices. Disc of scutellum polished and with hardly a trace of punctuation. Propodeum with considerable rugosity around sides and along sides of medial keel; on each side of the medial keel the surface becomes smooth, shining. Metacarp fully six times as long as its distance from the apex of the radial cell; 1st abscissa of the discoideus not longer than the 2nd; hind wing rather narrow; cubitellian cell of the hind wing about as high as wide.

Ovipositor sheath about one and a quarter times longer than the hind tibia; ovipositor evenly curved and without an apical attenuation.

Length: 2.8 mm. without ovipositor.

S. AFRICA: Cape Province, Mossel Bay, i.1922, 1 ♀, the *TYPE*, (*R. E. Turner*).

Type in the British Museum (Nat. Hist.).

The propodeum of this species is rather long with its lateral field not at all transverse. The species is characterized by the combination of the short antenna and the

unusually coarse sculpture of the first tergite ; in both these respects, however, there is an approach to the European *vindicius*.

Apanteles vindicius sp. n.

♀. This species has more in common with the African *lynceus* than the typical members of the *merula*-group, such as *lacteoides* and *merula*. It may be compared with *lynceus* as follows:

Wings almost hyaline but lacking a milky white tint. Hind tibia infusate on apical half, becoming reddish towards base.

Face more strongly punctate ; the punctures coarser, subconfluent ; the punctate face is quite a feature of the species. Antenna longer with the preapical segment slightly longer than wide. Posterior ocelli slightly further apart than in *lynceus*.

Mesoscutum densely, deeply punctate, the punctures crowded and confluent along the course of the notaulices and forming dull bands. Disc of the scutellum with some coarse punctation along the sides. Propodeum a little shorter than in *lynceus* ; a lateral field slightly transverse ; across the brow, the propodeum is dull, densely, almost coarsely rugose and rather thickly clothed with long, stiff hairs ; posterior corners rather strongly raised, the surface between them and the strong medial keel slightly hollowed out and covered with coarse, shiny rugosity that is weaker medially. Inner spur of the middle tibia slightly more powerful than in *lynceus* and fully reaching apex of middle basitarsus.

Tergite 1 less rugose than in *lynceus* but more rugose than in the other species of the group ; at sides where it turns over, the surface shows deep, contiguous punctation ; elsewhere the horizontal surface is dull, finely rugose but with a coarser patch medially. Ovipositor sheath very slightly shorter than the hind tibia.

Length: 3.2 mm. without ovipositor.

EUROPE : Italy, Laguna Veneta, 1 ♀, the *TYPE*, (*G. Soika*).

Type in the British Museum (Nat. Hist.).

No other species of the group has the anterior part of the propodeum so coarsely rugose. The densely punctate mesoscutum is also important for the recognition of the species.

Apanteles detrectans Wilkinson

Apanteles detrectans Wilkinson, 1928a : 110.

♀. Hind tibia infusate on less than apical half ; towards base becoming clear yellow. Wings hyaline ; most of the venation colourless ; stigma pale yellow without noticeably darker border but the metacarp brownish.

Face impunctate. Antenna shorter than the body, very slightly tapered towards apex ; preapical segment about one and a quarter times longer than wide ; flagellar pubescence hardly noticeable. Distance between posterior ocelli distinctly greater than the distance between one of them and the eye-margin, 5:3.

Mesoscutum finely, rather indistinctly punctate. Disc of scutellum shiny and with faint traces of punctation. Propodeum short, with medial keel ; otherwise shining and almost smooth. Abscissa 1 of the discoideus as long as 2 ; nervellus of hind wing straight ; cubitellian cell slightly higher than wide.

Horizontal part of tergite 1 shining, almost smooth. Median field of tergite (2 + 3) (Text-fig. 161).

Length: ca. 3 mm. without ovipositor.

INDIA : Pusa (type locality). AFRICA : Sudan, Gureir, ii-iii.1939, 3 ♀♀, bred from caterpillar on Senna (*Cassia*).

Type in the British Museum (Nat. Hist.).

Host : The original series was bred from a Phycitid larva.

Apanteles isus sp. n.

♀. Very close to *detrectans* from which it differs as follows:

Antenna a little longer and thicker, with the preapical segment not longer than wide.

Mesoscutum more shiny, its punctation finer and more superficial and not closer along the course of the notaulices ; in *detrectans* the punctation is crowded enough along the course of the notaulices to form a band of duller sculpture. Disc of the scutellum polished, impunctate. Metacarp between two and a half and two and a quarter times longer than its distance from the apex of the radial cell.

Ovipositor sheath one and one third times longer than the hind tibia.

EUROPE : Hungary, Kiralyhalom, 2 ♀♀, one the *TYPE*, 2 ♂♂, bred 8.viii.1936 from *Etiella zinckenella*.

Type in the British Museum (Nat. Hist.).

Host : *Etiella zinckenella* Treitschke (Phycitidae).

Except for the colour of the stigma and the almost colourless venation, this species is also very closely related to *merula*. In fact, the four species, *merula*, *detrectans*, *isus* and *meruloides* form a small, compact group within the larger group, characterized chiefly by the smooth looking propodeum with its percurrent keel and simple, gently downcurved ovipositor.

Apanteles merula Reinhard

Apanteles merula Reinhard, 1880 : 366.

♀. Stigma evenly brown ; venation fully pigmented throughout. Hind tibia in greater part yellowish but becoming infusate towards apex.

Face impunctate and with a satin-like sheen. Antenna a little shorter than the body, with the two preapical segments almost square in outline ; unlike *detrectans* and *isus*, the pubescence of the flagellum is more noticeable, somewhat bristly (Text-fig. 171). Distance between the posterior ocelli equal to the distance between one of them and the eye-margin.

Mesoscutum somewhat dull, finely, densely punctate with the punctures more crowded and forming duller bands along the course of the notaulices ; in this respect, the sculpture of the mesoscutum is unlike that of *isus* but differs from that of *detrectans* only in that the surface is duller. Hind wing rather narrow ; cubitellian cell not higher than wide.

Ovipositor sheath about as long as the hind tibia ; ovipositor with weak apical attenuation. Length: ca. 3.2 mm. without ovipositor.

EUROPE.

Type in the Zoologisches Museum der Universität, Berlin.

My interpretation of this species is based on a female in the British Museum (Nat. Hist.), compared by Wilkinson with Reinhard's type. *A. merula* is largely characterized by the sculpture of the mesoscutum.

Apanteles etiellae Viereck

Apanteles (*Pseudapanteles*) *etiellae* Viereck, 1911 : 178.

Apanteles iselyi Cushman, 1919 : 120 [synonymy, Muesebeck, 1920].

Apanteles etiellae Viereck ; Muesebeck, 1920 : 531.

This is a North American species and in the British Museum collections are a male and a female determined by Muesebeck. These are from Iowa, Shenandoah and were bred from *Canarsia hammondi* Riley (Phycitidae).

The only difference I can find of significance between *etiellae* ♀ and *merula* ♀ is that the flagellum of *etiellae* lacks upstanding bristly pubescence, the venation proximal to the areolet is virtually colourless and the ovipositor sheath is very slightly shorter. Further investigation may show the two species to be the same.

Apanteles meruloides sp. n.

♀. This species is extremely like *merula* but certainly distinct on a much longer metacarp. The antenna is not only longer but also thinner ; however the pubescence of the flagellum is similar to that of *merula*.

The punctuation of the mesoscutum is somewhat sharper and more distinct than in *merula*.

Tergite 1 more sharply narrowed behind, its horizontal part longer, duller and with sharp, discrete punctures ; in *merula*, the surface here is less distinctly punctate.

EUROPE : Turkey, Bornova, 2 ♀♀, one the TYPE, 1 ♂, ex *Polychrosis botrana*; Izmir, ix.1937, 3 ♀♀, 4 ♂♂, labelled " in stored dry fig ".

Type in the British Museum (Nat. Hist.).

Host : *Polychrosis botrana* Schiffermüller (Olethreutidae).

Apanteles lacteoides sp. n.

Apanteles lacteus Nees ; of authors.

♀. Wings milky white ; costa and stigma yellow ; metacarp contrasting dark brown ; hind tibia reddish-yellow on rather more than basal half ; becoming blackened towards apex. Tegula whitish.

Head (Text-fig. 167). Antenna a little shorter than the body with the three preapical segments almost twice as long as wide, shiny and closely articulated ; apical segment thin, sharply pointed (Text-fig. 172) ; pubescence of flagellum so fine as to be hardly noticeable. Distance between the posterior ocelli distinctly greater than the distance between one of them and the eye-margin, 5:4.

Mesoscutum strongly shining, its punctuation very superficial ; a faint trace of striate-punctuation at posterior end of notaulic courses. Disc of scutellum punctate along sides. Cubitellian cell of the hind wing about as wide as high.

Horizontal part of tergite 1 polished and at most with faint traces of punctuation. Seen from above, the ovipositor is distinctly constricted before apex.

Length: ca. 4 mm. without ovipositor.

♂. Like the female.

EUROPE : Sweden, Skåne, Ohus, 16.vii.1958, 2 ♀♀, one the TYPE, (K. J. Hedqvist), Degaberga, vii, 2 ♂♂, (D. M. S. & J. F. Perkins).

Type in Coll. Hedqvist.

This is the only species of the group with an elongate face and is easily recognised on this character alone. The sculpture of the mesoscutum is like that of *isus* but very different from that of *merula*.

***Apanteles aeolus* sp. n.**

♀. At first sight very like *lacteoides* but differing in several important details.

Wings, though hyaline, lacking the milky-white tint of *lacteoides* ; stigma pale with a faintly darker border but the metacarp not darker than the dark border of the stigma ; venation proximal to the areolet weakly pigmented.

Head from in front not in the least subtriangular. Antenna longer than in *merula* and *isus* but a little shorter than in *lacteoides* with the preapical segment about one and one third times longer than wide.

Mesoscutum more sharply and distinctly punctate than in *lacteoides* ; the punctation considerably stronger than in *isus*.

Tergite 1 very broad at base (Text-fig. 164), broader than in *lacteoides* ; horizontal surface with some fine surface sculpture and vague punctation ; hence a little dull by comparison with *lacteoides*. Ovipositor sheath hardly longer than the hind tibia ; ovipositor evenly but weakly curved throughout.

Length: 3.8–4 mm. without ovipositor.

EUROPE : Germany, Hamburg, 26.vii.1906, 1 ♀, the *TYPE*, said to have been bred from *Salebria betulae*, (A. C. W. Wagner Coll.) ; Wittenbergen, 7.vii.1931, 1 ♀, (A. C. W. Wagner Coll.).

Type in the British Museum (Nat. Hist.).

Host : *Salebria betulae* Goeze (Phycitidae). This record needs confirmation.

***Apanteles cajani* Wilkinson**

Apanteles cajani Wilkinson, 1928a : III.

♀. Body brownish with faint reddish tinge ; hollowed out, basal part of tergite 1 reddish. Wings hyaline but without a milky-white tint ; stigma pale yellow ; metacarp darker but its colour not in sharp contrast with that of the stigma ; venation proximal to the areolet weakly pigmented.

Head in a facial view markedly transverse ; above dull, with satin-like sheen and traces of punctation, especially above antennal scrobes. Face distinctly but not deeply punctate. Antenna shorter than the body, rather thin, with the preapical segment about one and one third times longer than wide and segment 16 almost one and a half times longer than wide. Distance between the posterior ocelli equal to the distance between one of them and the eye-margin.

Mesoscutum somewhat dull, densely, discretely punctate ; the punctures more crowded along the course of the notaulices to form duller bands of rugosity. Abscissa 1 of the discoideus not longer than the nervulus ; metacarp about four and a half times longer than its distance from the apex of the radial cell. Cubitellian cell of the hind wing a little higher than wide.

Tergite 1 not strongly narrowed behind (Text-fig. 163) ; sharply punctate along sides and especially where it turns over. Ovipositor sharply downcurved at apex.

Length: ca. 4 mm. without ovipositor.

INDIA : Pusa (type locality).

Type in the British Museum (Nat. Hist.).

This species is extremely like *myeloenta* and the differences between the two species are subtle and difficult to appreciate.

Apanteles myeloenta Wilkinson

Apanteles myeloenta Wilkinson, 1937 : 463.

♀. Somewhat more stoutly built than *cajani* and black in colour.

Apart from the slight sculptural and structural differences given in the key, *myeloenta* has the propodeum duller than *cajani*, more sculptured and with a finer, more extensive pubescence. As pointed out by Wilkinson in his description of *myeloenta*, this species has the apical excision of the hypopygium deeper than in *cajani*.

Tergite 1 is more narrowed behind than in *cajani* (cf. Text-fig. 163).

EUROPE : Cyprus.

Type in the British Museum (Nat. Hist.).

Host : *Myelois ceratoniae* Zeller (Phycitidae), a pest of the beans of the carob tree, *Ceratonia siliqua*.

This species and *cajani* are in need of further study. Both are related to the following species, *apidanus*.

Apanteles apidanus sp. n.

♀. Hind tibia sharply whitish at extreme base ; hind tarsus infusate throughout. Stigma with well marked darker border ; 1st and 2nd abscissae of the discoideus and the nervulus pigmented.

Head in a facial view markedly transverse. Face shining, finely, indistinctly punctate. Head above, dull, finely roughened. Distance between the posterior ocelli equal to the distance between one of them and the eye-margin.

Mesoscutum shiny, densely, finely punctate and with a distinct coarsening of sculpture along the course of the notaulices. Disc of scutellum polished, impunctate. Propodeum on each side of the percurrent, longitudinal keel with a fine, dull microsculpture, nowhere polished. Anterior part of mesopleurum finely rugose and without evidence of punctation. Metacarp about three and a half times longer than its distance from the apex of the radial cell ; 1st abscissa of the discoideus very slightly shorter than the 2nd.

Horizontal part of tergite 1 smooth-looking and with a satin-like sheen ; some indistinct punctation along sides. Median field of tergite (2 + 3) large and not strongly transverse for the group. Ovipositor sheath very long, nearly two and a quarter times longer than the hind tibia ; the apical situation of the ovipositor is very weak.

Length: ca. 3.3 mm. without ovipositor.

S. AFRICA : Transvaal, Alkmaar, 16.iv.1926, 1 ♀, the *TYPE*, labelled " bred from larva on grape-fruit stock ", (*L. A. Amphlett*).

Type in the British Museum (Nat. Hist.).

Apanteles jason sp. n.

♀. Closely related to *merula* from which it differs chiefly in details of wing venation.

Wings milky-white with the venation proximal to the areolet colourless ; stigma evenly dark brown.

Preapical segment of the antenna twice as long as wide. Distance between the posterior ocelli distinctly less than the distance between one of them and the eye-margin.

Mesoscutum less dull and more evenly punctate than in *merula*. Propodeal keel very narrowly forked and hence appearing double for most of its length. Hind wing much broader, with the cubitellian cell distinctly higher than wide.

Posterior, horizontal part of tergite 1 smooth, polished. In a dorsal view, the hairs of the ovipositor sheath are extremely short, not upstanding.

Length: 2.8 mm. without ovipositor.

MALAYA : Serdang, 14.iv.1932, 1 ♀, the *TYPE*, labelled "cocoon on tuba leaf", (*N. C. E. Miller*). JAVA : Tjipetir, 2.vi.1934, 1 ♀, (*C. Franssen*).

Type in the British Museum (Nat. Hist.). Second female in U.S. National Museum.

This rather small species has the hind wing broader than any other species among those having a short, evenly curved ovipositor.

Apanteles alfalfae Nixon

Apanteles alfalfae Nixon, 1960 : 303.

♀. Easily recognised by its polished mesoscutum, pale spot at base of stigma and short ovipositor. The distance between the posterior ocelli is very distinctly greater than the distance between one of them and the eye-margin. Cubitellan cell of the hind wing almost twice as high as wide (Text-fig. 131). Ovipositor (Text-fig. 173). Basal tergites (Text-fig. 166).

AUSTRALIA.

Type in the British Museum (Nat. Hist.).

Host : *Etiella behrii* Zeller (Phycitidae), a pest of lucerne.

This species is more closely related to such species as *merula* and *jason* than to the *myeloenta-cajani* complex.

Apanteles tedanius sp. n.

♂♀. Black. Wings hyaline but the venation dark brown and fully pigmented throughout ; stigma evenly dark brown. Hind tibia blackish but yellowish on basal quarter ; sometimes the pale colour extends over almost basal half ; hind basitarsus whitish on fully basal half.

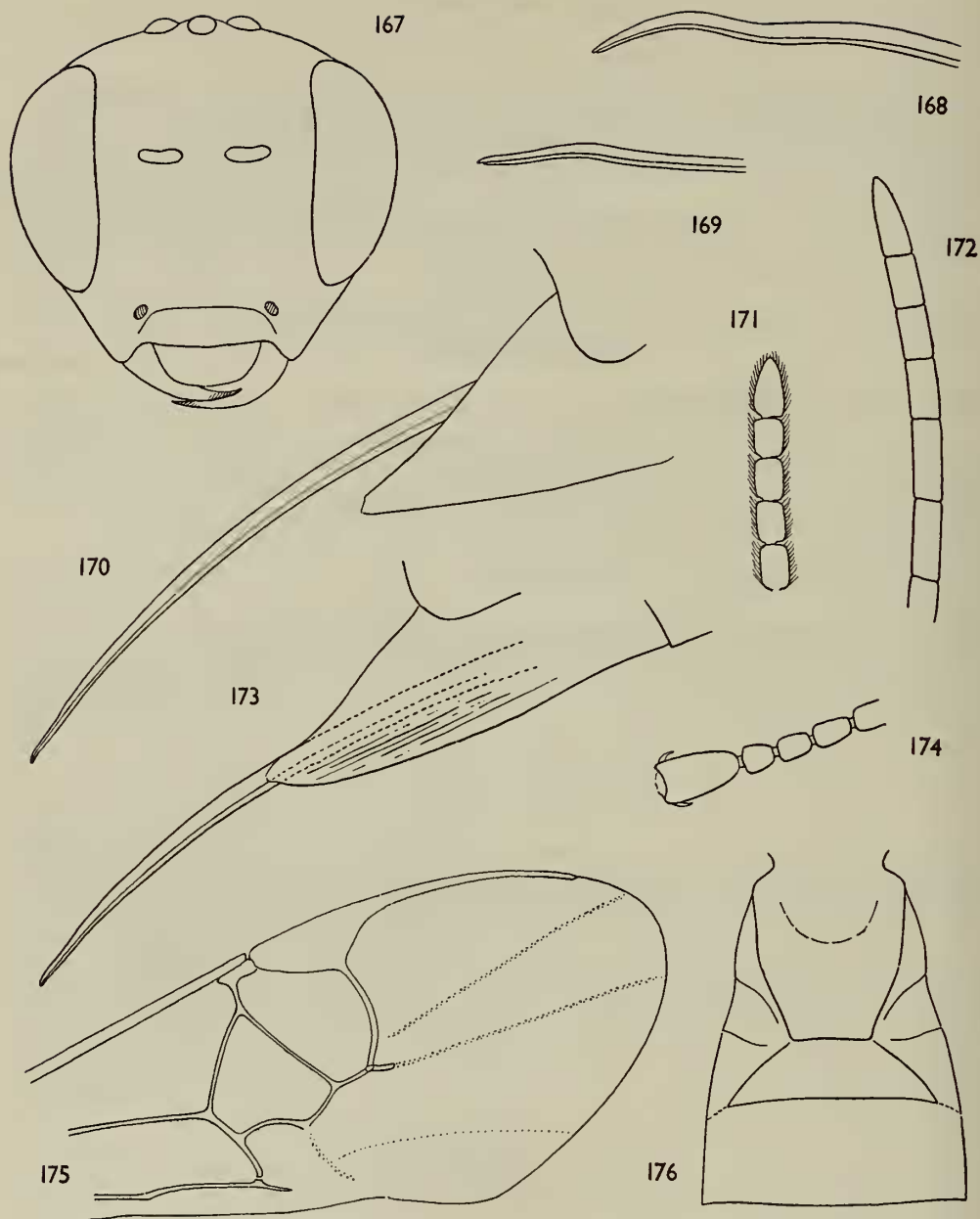
♀. Head in a facial view more or less circular. Face quite dull, closely reticulate-punctate. A similar sculpture covers temples and vertex. Antenna about as long as the body ; the three preapical segments somewhat loosely articulated, almost moniliform with segment 17 hardly longer than wide. Distance between the posterior ocelli not at all greater than the distance between one of them and the eye-margin.

Mesoscutum quite dull, like the head, closely, heavily punctate all over ; the punctures slightly larger along the course of the notaulices. Disc of scutellum punctate towards sides. Propodeum dull, rugose all over with percurrent medial keel. Wings: abscissa 1 of the discoides much longer than the nervulus ; metacarp about two and a half times longer than its distance from the apex of the radial cell ; a conspicuous angle between abscissa 1 of the radius and the transverse cubitus ; vannal lobe not at all concave and with trace of a weak fringe ; basella strongly incurved. Apical tarsal segment of all legs, especially the front pair, considerably enlarged (Text-fig. 174).

Tergite 1 (Text-fig. 165), not very strongly narrowed behind, dull, with satin-like sheen and weakly punctate towards sides. Ovipositor sheath very slightly longer than the hind tibia ; seen from above with long, upstanding hairs. Ovipositor weakly, evenly curved throughout.

Length: ca. 3.8 mm. without ovipositor.

♂. Like the female except for the sexual differences.



FIGS. 167-176. *Apanteles*: 167, *lacteoides* sp. n., ♂; head, from in front; 168, *briareus* sp. n., apex of ovipositor; 169, *apidanus* sp. n., same; 170, *camilla* sp. n., ovipositor; 171, *merula* Reinhard, apical segments of flagellum, ♀; 172, *lacteoides* sp. n., same; 173, *alfalfae* Nixon, ovipositor; 174, *tedanius* sp. n., front tarsus, ♀; 175, *jason* sp. n., ♀, fore wing, part; 176, *hebrus* sp. n., ♀, basal tergites.

PHILIPPINES : Benguet, Baguio, 5 ♀♀, one the *TYPE*, 19 ♂♂ ; Mindañao, Dapitan, 1 ♀, 1 ♂, (all *Baker*) ; Mt. St. Thomas, near Baguio, 6,500 ft., xii & iv, 5 ♀♀, 6 ♂♂ ; Negros Or., Mt. Canlaon, v, 1 ♀, 1 ♂, (*H. M. & D. Townes*).

Type in the U.S. National Museum.

This most distinctive species is aberrant and departs in many particulars from the pattern of the *merula*-group. Apart from the form of the vannal lobe, the polished field at the side of the scutellum is smaller and less extended forwards so that the furrow between itself and the disc is not linear as in the typical species of the group. Nor is the polished field at side of scutellar disc provided with a sharp, raised edge behind.

I have included the species in the *merula*-group chiefly on account of the medial propodeal keel and the shape of the first tergite. Specifically it is essentially characterized by the dull, heavily punctate sculpture of the head and thorax. I know of no species with which it could be confused.

Apanteles camilla sp. n.

♀. Stigma pellucid with a darker border. Hind leg black virtually throughout ; only the merest trace of pallor at base of tibia ; middle legs also blackish but the middle tibia reddish on about basal quarter.

Head from in front slightly transverse ; above dull, finely roughened ; temples more strongly rugose. Face dull, roughened, its rugosity consisting of minute granulations. Distance between the posterior ocelli equal to the distance between one of them and the eye-margin. Antenna as long as the body, rather thin and with the preapical segment about one and half times longer than wide.

Mesoscutum finely punctate ; punctures finest and somewhat obsolescent along each side of the middle line and the surface here showing a satin-like sheen ; the punctures are coarsest broadly along the course of the notaulices ; the two posterior areas of rugose-punctuation are almost confluent. Disc of scutellum polished, with a few punctures along sides ; polished, lateral zone of scutellum not extending so far forwards as is usual in the *merula*-group. Metacarp about five times as long as its distance from the apex of the radial cell ; vannal lobe strongly concave. Propodeum dull, rugulose, the sculpture stronger medially ; no trace of a medial keel.

Tergite (2 + 3) beyond the dull, finely rugose median field, with a satin-like sheen. Ovipositor sheath broad, about as long as the hind tibia. Ovipositor (Text-fig. 170).

Length: ca. 3.5 mm. without ovipositor.

INDIA : Shillong, 27.ix.1961, 1 ♀, the *TYPE*, labelled " ex caterpillar attacking Pine-shoot ", (*V. P. Rao*).

Type in the British Museum (Nat. Hist.).

This species is aberrant within the *merula*-group on account of the absence of a sharp, posterior margin to the lateral, polished zone of the scutellum and the reduced forward extension of this. With regard to scutellar structure, *camilla* is like the species of the *metacarpalis*-group. None of the species of this group, however, has a concave vannal lobe, though *dioryctriæ* has the edge of the vannal lobe beyond its widest part almost straight and in general facies is very like *camilla*.

Apanteles camilla must be regarded as transitional between the group of *merula* and that of *metacarpalis*. Its existence serves to stress the difficulty of defining species-groups within *Apanteles*.

THE *GRANDICULUS*-GROUP

Species of slender build. Propodeum without either areola or median keel but with some rugae radiating from the posterior orifice ; in the Madagascan *seyrigi*, these rugae vaguely indicate a wide-bottomed areola. Inner spur of the hind tibia not or hardly reaching the middle of the basal segment of the tarsus. Basella of the hind wing always deeply incurved on the vannal lobe side so that the submediellian cell is always markedly different in shape from that found in the *merula*-group (Text-fig. 160) ; cubitellian cell at least as wide as high (Text-fig. 180).

Tergite 1 always strongly narrowed behind and much like that of the *merula*-group in general appearance and sculpture. Median field of tergite (2 + 3) much less transverse than in the *merula*-group (Text-fig. 166) and see Text-fig. 179. Ovipositor sheath at least one and two thirds as long as the hind tibia.

Old World. The group seems natural and the species are very much alike in general facies.

KEY TO SPECIES

FEMALES

- 1 Mesoscutum very obviously and sharply punctate ; lateral polished zone of scutellum pushed far forwards so that the furrow between itself and the disc of the scutellum is parallel-sided for a long distance or even slightly constricted at middle ; median field of tergite (2 + 3) not less than half as long as the rest of the tergite 2
- Mesoscutum polished, impunctate and with a rather loose, silky pubescence ; median field of tergite (2 + 3) hardly one third as long as the rest of the tergite and with sharply drawn out lateral angles ; lateral polished zone of scutellum much less pushed forwards so that the furrow between itself and the disc of the scutellum is nowhere parallel-sided.
- Hind femur red ; inner spur of the hind tibia hardly two fifths as long as the basal segment of the tarsus *emesa* sp. n. (p. 169)
- 2 Stigma evenly brown ; median field of tergite (2 + 3) slightly less transverse ; abscissa 1 of the radius not or hardly longer than the transverse cubitus and forming a distinct angle with it 3
- Stigma pale with darker border ; median field of tergite (2 + 3) slightly more transverse ; abscissa 1 of the radius obviously longer than the transverse cubitus and hardly forming an angle with it 4
- 3 Stigma emitting radius very distinctly distal to middle ; stigma narrower *orsedice* sp. n. (p. 167)
- Stigma emitting radius hardly distal to middle ; stigma broader *conopiae* Watanabe (p. 167)
- 4 Hind coxa blackened ; hind tarsus hardly darker than the red tibia *grandiculus* Wilkinson (p. 166)
- Hind coxa bright red ; hind tarsus infusate and much more in contrast with the red tibia *seyrigi* Wilkinson (p. 169)

Apanteles grandiculus Wilkinson

Apanteles grandiculus Wilkinson, 1929a : 110.

♀. Wings hyaline without milky tint ; most of the venation proximal to the areolet faintly pigmented ; tegula testaceous. Gaster brown rather than black.

Face shiny, distinctly but rather superficially punctate. Temples shiny but distinctly and rather finely rugose-punctate. Posterior tangent to the anterior ocellus hardly touching the posterior pair. Antenna almost as long as the body with the preapical segment almost twice as long as wide; flagellum somewhat bristly.

Mesoscutum shiny, densely punctate; no obvious crowding of punctures to mark the course of the notaulices. Disc of scutellum shiny, punctate almost all over. Suture between mesoscutum and disc of scutellum in the form of a thin, very shallow, hardly foveate groove. Propodeum very shiny and with traces of punctuation anteriorly. Hind wing (Text-fig. 180).

Tergite 1 very shiny, smooth, except for faint traces of aciculation on its posterior horizontal part (Text-fig. 179). Ovipositor sheath fully twice as long as the hind tibia, very thin; ovipositor very thin and with a weak apical sinuation (Text-fig. 178).

Length: 4 mm. without ovipositor.

INDIA: Assam, Shillong, 2 ♀♀.

Type in the British Museum (Nat. Hist.).

Recorded by Wilkinson as a parasite of a lepidopterous borer in *Rubus* sp.

Apanteles conopiae Watanabe

Apanteles conopiae Watanabe, 1934: 139.

This species is extremely close to *grandiculus* and may indeed not be distinct from it. Nevertheless, since the two species can be separated on the colour of the stigma I am provisionally keeping them apart.

♀. Apart from the evenly brown stigma, all the venation proximal to the areolet shows normal pigmentation.

Face and temples slightly less distinctly punctate. Antenna slightly shorter and slightly thinner, with the preapical segment fully twice as long as wide.

Mesoscutum more finely, more superficially punctate.

JAPAN: Tokio, ♂ and ♀ paratypes in British Museum (Nat. Hist.), bred from *Conopia hector*. MALAYA: Trengganu, ii.1955, 2 ♀♀ bred from *Conopia theobroma*.

Type in Hokkaido Imperial University.

Host: *Conopia hector* Butler; *Conopia theobroma* Bradley. (Aegeriidae).

I am satisfied that I have correctly determined the two Malayan females as *conopiae*. The species evidently has a wide distribution and only more material can decide how *conopiae* and *grandiculus* stand in relation to each other.

The wings of the two Japanese paratypes are stained with brown. I am inclined to think that this may not be natural to the insects.

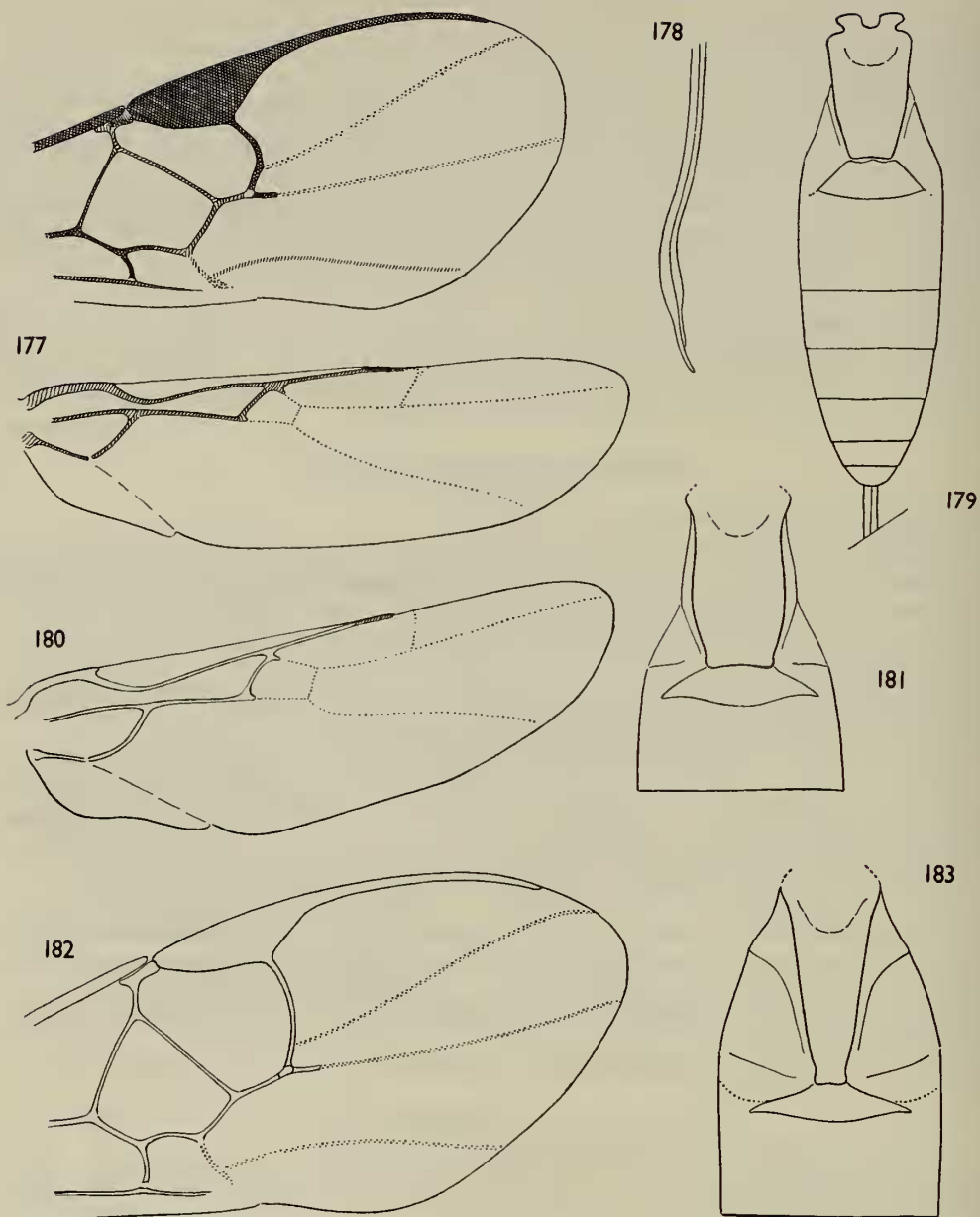
Apanteles orsedice sp. n.

This species has the stigma dark brown and the venation throughout deeply pigmented. Although more heavily built than either of them, it is clearly closely related to both *grandiculus* and *conopiae*.

♀. May be compared with *grandiculus* as follows:

Wings faintly but distinctly darkened. The red hind tibia tipped with weak infuscation; hind tarsus weakly infuscate.

Temples hardly punctate, the surface with a distinct satin-like sheen. Antenna relatively a little longer, slightly tapered distally and with the preapical segment fully twice as long as wide.



FIGS. 177-183. *Apanteles*, ♀: 177, *taeniaticornis* Wilkinson, fore wing, part, & hind wing; 178, *grandiculus* Wilkinson, apex of ovipositor; 179, *grandiculus* W., gaster, dorsal; 180, *grandiculus* W., hind wing; 181, *myrsus* sp. n., basal tergites; 182, *seyrigi* Wilkinson, fore wing, part; 183, *taeniaticornis* W., basal tergites.

Sculpture of the mesoscutum and of disc of scutellum as in *grandiculus*. Inner spur of the hind tibia relatively a little shorter in proportion to the length of the basal segment of the tarsus ; hind tarsus slightly thinner than in *grandiculus*.

Apex of the ovipositor with a weak apical sinuation similar to that of *grandiculus*.

NEW BRITAIN : near Rabaul, Keravat, vii.1958, 3 ♀♀, one the *TYPE*, bred from larva of Aegeriid, (*G. S. Dun*).

Type in the British Museum (Nat. Hist.).

Apanteles seyrigi Wilkinson

Apanteles seyrigi Wilkinson, 1936 : 81.

♀. This species is closely and naturally related to *grandiculus*. It may be compared with that species as follows:

Colour altogether brighter. Tegula ivory white. All the coxae bright red. Venation proximal to the areolet more pallid.

Face less convex than in *grandiculus*, almost flat, with the clypeus more transverse and more distinctly punctate. Ocelli in a slightly higher triangle, the posterior transverse tangent to the anterior ocellus passing in front of the posterior pair. Antenna relatively longer, with the preapical segment about two and a half times longer than wide ; flagellum less bristly.

Punctuation of the mesoscutum slightly less close, the punctures discrete, hardly more crowded along the course of the notaulices ; these show as very broad, shallow impressions. Setae of the basal half of the fore wing much sparser, widely absent along medius side of both median and submedian cells ; 1st abscissa of radius much longer than the transverse cubitus and forming with it a single, feebly curved vein ; radial cell distinctly downcurved at apex (Text-fig. 182). Outer, upper surface of the hind tibia much more densely spinose than in *grandiculus*, the spines markedly projecting when the tibia is seen from the side.

♂. Hind coxa brown ; hind tibia faintly tipped with infuscation. Stigma more pallid than in the female.

Length: ca. 5 mm. without ovipositor ; considerably larger than *grandiculus*.

MADAGASCAR : Bekily.

Type in the Paris Museum. Paratypes in British Museum (Nat. Hist.).

Host : Granger (1949) records *Epitarsipus rufithorax* Le Cerf (Aegeriidae) as the host of this species.

Apanteles emesa sp. n.

This is the most aberrant of the five species I include in the group and differs sharply from the others in having a completely impunctate mesoscutum and scutellar disc. Other details of significance have been given in the key ; there is little to add.

♀. Head and thorax deep black. Most of the venation proximal to the areolet very pale ; stigma dark brown. All the coxae blackish ; hind tibia at extreme tip on inner side and the hind tarsus, infuscate.

Face, head above and the temples polished, impunctate. Ocelli in a somewhat higher triangle with the posterior transverse tangent to the anterior ocellus clearly passing in front of the posterior pair. Preapical segment of the antenna about one and two thirds times longer than wide.

Abscissa 1 of the radius much longer than the transverse cubitus and forming with it a weakly curved vein as in *seyrigi* (cf. Text-fig. 182). Thicker spines along upper part of outer side of hind

tibia adpressed and somewhat weak. Ovipositor sheath nearly two and a half times longer than the hind tibia. Tergite 1 completely smooth and polished. Tip of ovipositor downcurved and, seen from the side, hardly different from that of *grandiculus*.

Length: 4.5 mm. without ovipositor.

S. AFRICA : Cape Province, Ceres, 1,500 ft., 27.x.-xi.1920, 1♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

This is a most distinct species if only on account of the shortness of the median field of tergite (2 + 3).

THE *SUNDANUS*-GROUP

At least the femora and trochanters bright reddish yellow ; broad membranous sides of tergite 1 yellow or reddish yellow.

Head deep from back to front ; the deeply scooped out occipital region extends forwards right up to the ocelli. Distance between the posterior ocellus and the eye-margin distinctly less than twice than longer diameter of the ocellus.

Metacarp very long, almost closing the radial cell ; 1st abscissa of the radius and the transverse cubitus together forming a very strongly curved vein (Text-fig. 201) ; cubitellian cell of the hind wing distinctly longer than wide ; vannal lobe beyond its widest part with straight edge that sometimes shows a few projecting hairs. Hind coxa very large ; inner spur of the middle tibia reaching to apex of basal segment of tarsus ; legs altogether long and slender.

Tergite 1 very strongly narrowed behind, its anterior, declivous part deeply hollowed out and much paler in colour than the sides and posterior part of the tergite. Ovipositor sheath short, not more than two thirds as long as the hind tibia.

Indo-oriental region.

Differs mainly from the *merula*-group in having the cubitellian cell of the hind wing longer and longer hind tibial spurs.

KEY TO SPECIES

FEMALES

- A Hind tibia and hind tarsus dark brown, in sharp contrast with the reddish-yellow hind femur ; hind coxa darkened at base ; posterior half of mesoscutum and the disc of the scutellum dull, with satin-like sheen and only a weak, vague trace of punctation ; face impunctate, with pronounced satin-like sheen ; posterior half of gaster almost black *sundanus* Wilkinson (p. 170)
- B Hind tibia and hind tarsus hardly different in colour from the reddish-yellow hind femur ; hind coxa entirely reddish-yellow ; posterior half of the mesoscutum and the disc of the scutellum shiny, with a satin-like sheen and conspicuously punctate ; face shiny, very distinctly punctate ; posterior half of the gaster reddish brown, becoming reddish-yellow beneath *ariadne* sp. n. (p. 171)

Apanteles sundanus Wilkinson

Apanteles sundanus Wilkinson, 1931 : 482.

♀. Wings faintly brown and the venation brown throughout. Antenna broken but the 16

existing segments indicate an antenna that is considerably longer than the body ; segment 16 fully twice as long as wide.

Propodeum dull, with microsculpture and a few rugae in the area of the spiracle. Hind coxa with faint microsculpture and pronounced satin-like sheen. No angle between abscissa 1 of the radius and the transverse cubitus ; transverse cubitus characteristically long.

Length: 3.4 mm. without ovipositor.

♂. The five males associated with the single female (type) by Wilkinson show a confusing variation in the colour of the hind legs ; the hind tibia and hind tarsus are paler than in the female and much less sharply contrasted with the reddish-yellow femur.

JAVA : Tjibodas, 5-7,000 ft.

Type in the British Museum (Nat. Hist.).

Apanteles ariadne sp. n.

♀. Antenna broken after the 14th segment ; this segment is twice as long as wide ; in *sundanus* segment 14 is three times as long as wide.

Whereas in *sundanus* the vannal lobe beyond its widest part shows a few projecting hairs, the edge is quite bare in *ariadne*. Hind coxa relatively smaller, more shiny and without indication of a satin-like sheen.

Length: 3 mm. without ovipositor.

CEYLON : Maskeliya, 4,200 ft., 15.vii.1919, 1 ♀, the TYPE, (N. K. Jardine).

S. INDIA : Kadaj Kanal, 1 ♂, (T. N. Campbell).

Type in the British Museum (Nat. Hist.).

THE MYCETOPHILUS-GROUP

Metacarp at least four times as long as its distance from the apex of the radial cell, usually much longer and almost closing the radial cell ; vannal lobe beyond its widest part more or less straight or even slightly concave and virtually free from projecting hairs ; cubitellan cell of the hind wing never higher than wide. Propodeum without trace of a median keel (cf. closely related group of *nerion*) and without trace of areolation. Hypopygium long, deeply infolded along the middle line and with numerous, lateral creases. Ovipositor sheath always longer than the hind tibia.

Indo-oriental region.

The group, as here defined, is somewhat artificial and may well contain species that are aberrant or convergent members of other groups. Possible affinities will be discussed under the separate species.

KEY TO SPECIES

FEMALES

- 1 Tergite 1 virtually parallel-sided.

Legs, apart from coxae, pale yellow including the hind tarsi ; hind tibia without apical infuscation and the hind basitarsus whitish towards base ; propodeum densely, rather coarsely punctate across its anterior part . *inunctus* sp. n. (p. 173)

- Tergite 1 distinctly, more usually strongly, narrowed to apex 2

- 2 Tergite 1 only slightly but quite distinctly narrowed apically.

Mesoscutum strongly shining, with a very fine, superficial punctation ; wings hyaline ; metacarp almost closing the radial cell *mycetophilus* Wilkinson (p. 173)

- Tergite 1 strongly narrowed to apex 3

- 3 Tergite 1 very long, highly polished ; propodeum, in contrast, dull, sculptured.
 Temples coarsely, densely punctate ; inner spur of the hind tibia not reaching middle of basal segment of tarsus ; ovipositor sheath markedly falcate towards apex, about one and a half times longer than the hind tibia and, seen from above, clothed with a dense, not in the least upstanding pubescence ; hind femora yellow 4
- Tergite 1 shorter, lacking this highly polished appearance and, if somewhat smooth, then the propodeum is not dull and is without such coarse sculpture 5
- 4 Larger, 3.2 mm. without ovipositor ; stigma very dark, emitting radius more distal to middle ; face somewhat flat ; disc of scutellum with larger, more numerous punctures *odites* sp. n. (p. 175)
- Smaller, 2.5 mm. without ovipositor ; stigma somewhat pale, emitting the radius nearer to middle ; face distinctly a little swollen on each side ; disc of scutellum with fewer, more indistinct punctures *inops* sp. n. (p. 179)
- 5 Eyes large, the shortest distance between a posterior ocellus and the eye-margin being distinctly less than twice the longer diameter of the ocellus ; face only very slightly wider than high, 6:5.
 Ovipositor sheath hardly one and a quarter times longer than the hind tibia, clothed with long, very sparse, upstanding hairs *lampe* sp. n. (p. 180)
- Eyes of normal size, the shortest distance between a posterior ocellus and the eye-margin being fully equal to twice the longer diameter of the ocellus ; face much more transverse 6
- 6 Gaster beyond tergite 1 bright reddish-yellow ; ovipositor sheath about one and a quarter times longer than the hind tibia
 Hind coxa bright reddish-yellow ; propodeum smooth, polished ; ovipositor sheath clothed with long, sparse, upstanding hairs *diaphantus* sp. n. (p. 175)
- Gaster dark throughout ; ovipositor sheath considerably longer than this 7
- 7 Tergite 1 dull red ; propodeum highly polished, smooth ; ocelli in a low triangle, the transverse, posterior tangent to the anterior ocellus obviously cutting the posterior pair.
 Hind tibia and hind tarsus unusually stout ; posterior width of tergite 1 distinctly greater than the length of the median field of tergite (2 + 3) *anticlea* sp. n. (p. 178)
- Tergite 1 as dark as, or darker than, the rest of the gaster ; propodeum less smooth, normally with some sort of weak rugosity almost everywhere (some large, polished areas in *calycinæ*) ; ocelli in a higher triangle, the posterior tangent to the anterior ocellus touching but not distinctly cutting the posterior pair. 8
- 8 Wings strongly embrowned ; the three basal cells of the fore wing densely setose right to base ; hind tibia and hind tarsus almost black ; maxillary palpi strikingly white 9
- Wings at most faintly tinted ; the three basal cells of the fore wing much less densely setose ; the anal cell only very sparsely setose towards base ; hind tibia and hind tarsus much paler ; maxillary palpi not thus strikingly white 10
- 9 1st abscissa of the radius distinctly shorter than the transverse cubitus ; tergite 1 not conspicuously wedge-shaped and without a wholly differentiated, polished, posterior tip ; tergites 4 and 5 with a broad, thin, membranous apical margin *pycnos* sp. n. (p. 179)
- 1st abscissa of the radius not shorter than the transverse cubitus ; tergite 1 conspicuously narrowed behind, wedge-shaped and its tip differentiated as an oval, polished area (Text-fig. 188) ; tergites 4 and 5 without such a thin, membranous apical margin *phaenna* sp. n. (p. 179)
- 10 Vannal lobe beyond its widest part with straight edge and here without trace of projecting hairs ; hind femur almost entirely yellow ; mesoscutum strongly

- shining and with only a very superficial punctation that posteriorly tends to fade out altogether *calycinae* Wilkinson (p. 175)
- Vannal lobe beyond its widest part very slightly convex and here with minute projecting hairs that are well separated ; hind femur brown ; mesoscutum faintly dull, with a fine, dense punctation that does not fade out posteriorly 11
- 11 Face more shiny and without clear indication of punctation ; antenna about as long as the body ; tergite 1 more strongly narrowed behind *iriarte* sp. n. (p. 176)
- Face less shiny and with clear indication of fine punctation ; antenna shorter than the body ; tergite 1 less narrowed behind *staius* sp. n. (p. 176)

Apanteles mycetophilus Wilkinson

Apanteles mycetophilus Wilkinson, 1931a : 76.

♀. Hind femur entirely yellow ; hind tibia becoming infusate distal to middle. Wings almost hyaline ; stigma dark brown. Antennal scape obscurely yellow.

Head strongly transverse (Text-fig. 192). Face somewhat flattened, shiny and with hardly a trace of punctation. Temples somewhat shiny and with weak punctation. Antenna a little shorter than the body ; preapical segment about one and one third times longer than wide ; flagellar pubescence somewhat bristly.

Mesoscutum strongly shining, with very small, mostly well separated punctures ; punctation tending to fade out on posterior half. Propodeum on the whole smooth, shining, except for traces of punctation across the brow and some short rugae radiating from the posterior orifice. No angle between the 1st abscissa of the radius and the transverse cubitus ; vannal lobe beyond its widest part very slightly concave and here without trace of projecting hairs. Hind tibia rather densely spinose.

Tergite 1 and 2 (Text-fig. 187) ; tergite 1 punctate and with faint rugosity on each side at apex, more coarsely sculptured against the polished tip. Ovipositor sheath about one and one third times longer than the hind tibia ; ovipositor straight but downcurved at apex.

Length: ca. 3.5 mm. without ovipositor.

INDIA : Dandeli, N. Kanara, Bombay.

Type in the British Museum (Nat. Hist.).

Host : The type series is labelled " ex fungus ".

Distinct from all the other species I include in the group on the shape of the basal tergites of the gaster. In general facies, *mycetophilus* is remarkably like *Microgaster parasitellae* Bouché and is another example of the confusing convergence occurring among species in widely different groups of *Apanteles* and *Microgaster*, s.l.

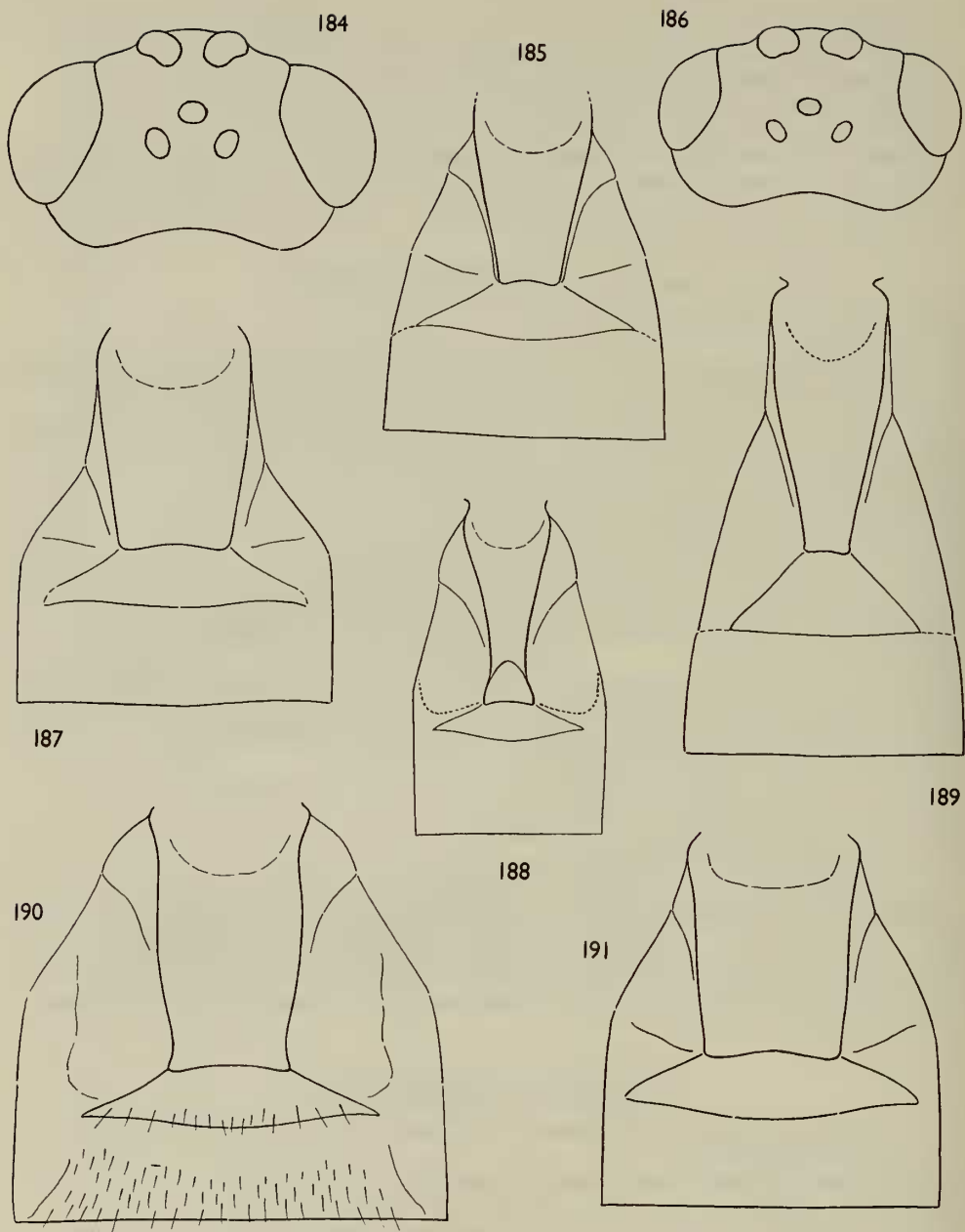
Apanteles inunctus sp. n.

♀. Evidently closely related to *mycetophilus* from which it differs on the shape of the 1st tergite. Other differences follows:—

Legs much more brightly yellow ; hind tibia without apical infuscation, whitish at base ; hind tarsus yellow, the basal segment whitish basally. Scape bright yellow.

Face more shiny and markedly punctate, lacking the flattened appearance of *mycetophilus* and with a distinct blister-like swelling above the clypeus. Flagellar pubescence less bristly.

Mesoscutum much more strongly and more distinctly punctate, the punctures larger and deeper. Lateral, polished zone of the scutellum less pushed forwards than in *mycetophilus* so that the rugose furrow between itself and the disc of the scutellum is nowhere parallel-sided. Spines of the outer side of the hind tibia finer, less dense, less upstanding, pale golden yellow. Stigma



FIGS. 184-191. *Apanteles*, ♀: 184, *lampe* sp. n., head, from above; 185, *anticlea* sp. n., basal tergites; 186, *phaenna* sp. n., head, from above; 187-191. Basal tergites of 187, *mycetophilus* Wilkinson; 188, *phaenna* sp. n.; 189, *odites* sp. n.; 190, *pycnos* sp. n.; 191, *inunctus* sp. n.

narrower ; 1st abscissa of the radius and the transverse cubitus distinctly angled at their junction ; metacarp shorter, its distance from the apex of the radial cell nearly equal to the 1st abscissa of the radius.

Horizontal part of tergite 1 smooth, shining, but with scattered punctures where it turns over and a narrow band of rugosity across the apical margin (Text-fig. 191). Ovipositor sheath as long as the hind tibia ; ovipositor evenly curved throughout, rather thick.

Length: ca. 3 mm. without ovipositor.

MALAYA : Penang, Balik Pulau, i.1948, 6 ♀♀, one the *TYPE*, labelled " ex pupa *Indarbela* sp. ". This host record is not likely to be correct.

Type in the British Museum (Nat. Hist.).

Were it not for the form of the vannal lobe, this species could not be excluded from the *laevigatus*-group.

Apanteles calycinae Wilkinson

Apanteles calycinae Wilkinson, 1928a : 113.

♀. Colour of legs like that of *mycetophilus*.

Face with only the merest trace of punctuation. Antenna as long as the body, rather thin and of weak build ; the preapical segment a little longer than wide.

Sculpture of mesoscutum hardly different from that of *mycetophilus*. Lateral, polished zone of scutellum more pushed forwards than in *mycetophilus* and much more so than in *inunctus*. Propodeum without punctuation across its brow. Venation like that of *inunctus*.

Tergite 1 (Text-fig. 195) finely, vaguely rugose towards apex ; the tip smooth, polished right across, the polished zone slightly transverse. Ovipositor sheath nearly one and a half times longer than the hind tibia.

Length: ca. 2.3 mm. without ovipositor, a much smaller species than either *mycetophilus* or *inunctus*.

INDIA : Dehra Dun.

Type in the British Museum (Nat. Hist.).

Host : Lepidopteron on *Kydia calycina* (Malvaceae) and *Shorea robusta* (Dipteraceae).

This is another species in which the vannal lobe beyond its widest part has a perfectly straight edge and is here without a trace of projecting hairs. It differs strikingly from both *mycetophilus* and *inunctus* in the shape of the 1st tergite but in most other respects *calycinae* is much like these two species.

Apanteles diaphantus sp. n.

♀. In addition to its bright yellow legs and predominantly yellow gaster, this little species has the scape yellow and the flagellum brownish. Tergite 1 is blackish with a dull reddish suffusion along and more specially towards base. Wings hyaline ; stigma dark brown.

Head not strongly transverse and above having a highly polished appearance ; face polished, smooth. Antenna distinctly shorter than the body, very slightly tapered apically and with the preapical segment about one and a half times longer than wide ; convex part of scape clothed with unusually long hairs (Text-fig. 197) ; flagellum also conspicuously hairy by comparison with the foregoing three species.

Mesoscutum highly shining ; in front (declivous part) closely punctate ; posteriorly becoming smooth, almost impunctate. Disc of scutellum flattened, polished ; lateral, polished field of

scutellum weakly developed, so that the rugose tongue between itself and the disc is nowhere parallel-sided. Vannal lobe beyond its widest part with sparse but distinctly projecting hairs ; angle between the 1st abscissa of the radius and the transverse cutibus distinct and marked by a stub ; metacarp distant from apex of radial cell by a length equal to about two thirds that of abscissa 1 of the radius. Dorsal furrow of side of pronotum not extending as far as the posterior margin of pronotum and hence not completely dividing the upper area from the middle area (Text-fig. 198).

Tergite 1 finely aciculate-punctate, gradually, strongly, narrowed from base to apex, fully twice as long as wide and turned over far posterior to middle.

INDIA : Bengal, Bagdogra, 13.vii.1937, 7 ♀♀, one the TYPE, 5 ♂♂, ex *Locastra muscosalis*, (C. F. C. Beeson).

Type in the British Museum (Nat. Hist.).

Host : *Locastra muscosalis* Walker (Pyralidae).

Easily recognised by the brightly coloured gaster in combination with the long hairs of the scape and the long, upstanding hairs of the ovipositor sheath.

Apanteles iriarte sp. n.

♀. This species is very like *calycinae*.

Legs on the whole obscurely brownish. Wings with very faint brownish tint ; stigma pale brown.

Head less transverse ; smooth above and with faint satin-like sheen.

Mesoscutum dull, with a dense, shallow punctation and a distinct satin-like sheen. Propodeum with a considerable amount of weak rugosity ; nowhere smooth and polished. Cubitellian cell of the hind wing about twice as wide as high.

Tergite 1 more narrowed behind than in *calycinae* and with a polished, differentiated apical zone that is slightly longer than wide (Text-fig. 196). Median field of tergite (2 + 3) very small. Ovipositor sheath a little shorter, about one and a quarter times longer than the hind tibia.

Length: ca. 2 mm. without ovipositor.

PHILIPPINES : Luzon, Mt. Makiling, 1 ♀, the TYPE, (Baker).

Type in the U.S. National Museum.

On the whole a poorly characterized species, most readily distinguished from *calycinae* and the following species, *statius*, on the sculpture of the mesoscutum and to a less extent on the small size of the median field of tergite (2 + 3).

Apanteles statius sp. n.

♀. Very closely related to *iriarte* and differing from it by little more than the characters given in the key.

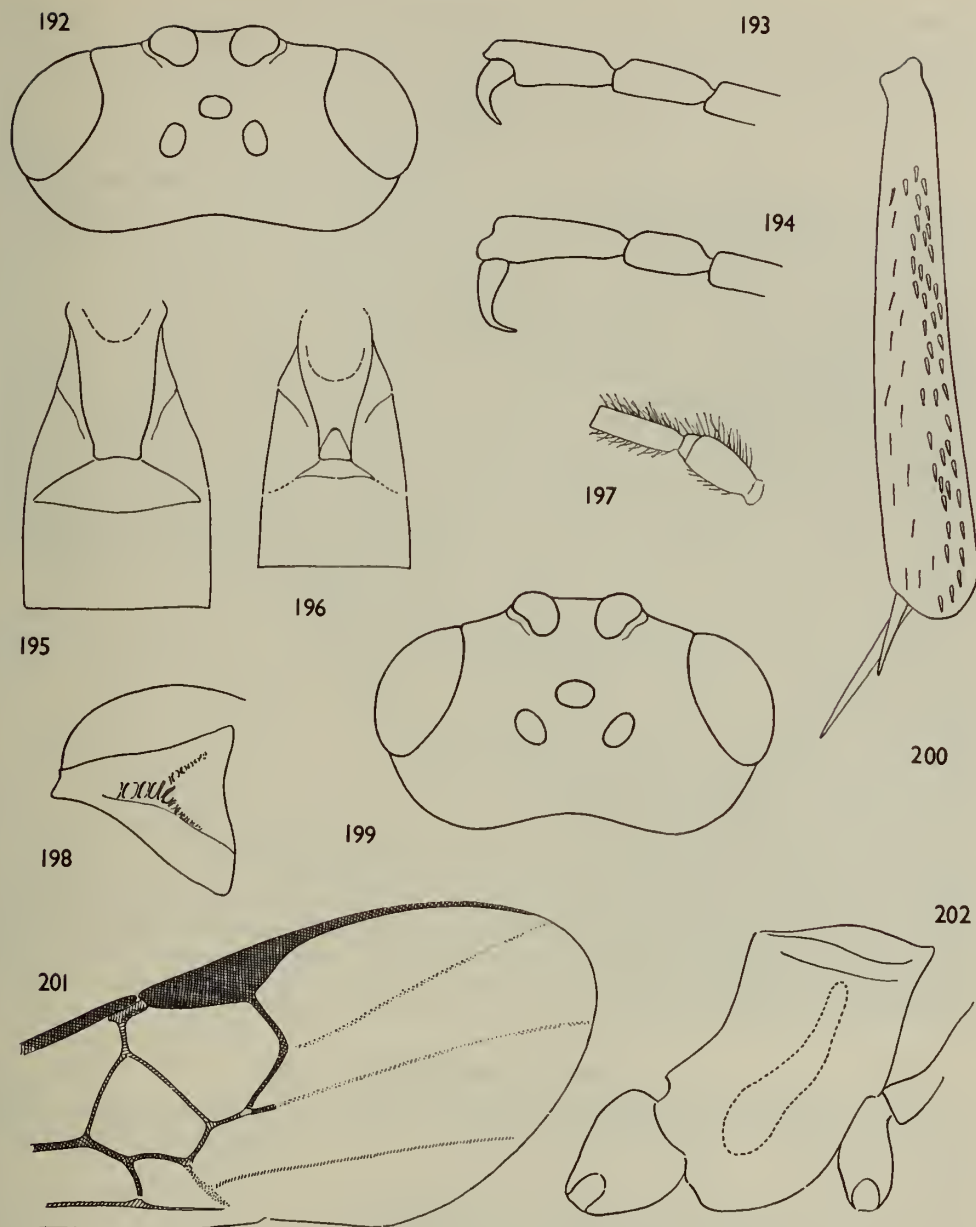
Head more transverse than in *iriarte* and much as in *calycinae*. The antenna is distinctly shorter than the body with the two preapical segments hardly longer than wide.

The appearance of the mesoscutum is subtly different, the surface being blacker (in *iriarte* the whole thorax has a faintly reddish tint), lacking the satin-like sheen and the punctation stronger.

The smooth tip of tergite 1 is less distinctly differentiated, the surface anterior to it being more shiny. Median field of tergite (2 + 3) relatively larger.

PHILIPPINES : Los Baños, 1 ♀, the TYPE, (Baker).

Type in the U.S. National Museum.



FIGS. 192-202. *Apanteles*, ♀: 192, *mycetophilus* Wilkinson, head, from above; 193, *conon* sp. n., hind claw; 194, *nymphis* sp. n., same; 195, *calyciniae* Wilkinson, basal tergites; 196, *iriarte* sp. n., same; 197, *diaphantus* sp. n., basal three antennal segments; 198, *diaphantus* sp. n., pronotum, lateral; 199, *taeniaticornis* Wilkinson, head, from above; 200, *natras* sp. n., hind tibia; 201, *sundanus* Wilkinson, fore wing, part; 202, *phalis* sp. n., right mesopleurum, to show furrow (dotted).

This species and *iriarte* are in need of further study and more material is required before the differences between them can be satisfactorily established.

***Apanteles anticlea* sp. n.**

A species more closely related to *mycetophilus* than to the *calycinæ-iriarte-statius* complex and altogether distinctive.

♀. Front and middle legs, apart from their coxae, bright yellow; hind tibia infusate but becoming paler on about basal third; hind tarsus yellow throughout; hind femur brown with paler tip. Scape in greater part yellow. Stigma dark brown as in *mycetophilus*.

Head strongly transverse. Vertex between ocelli and eye-margin smooth, with a satin-like sheen. The polished occiput is rather sharply marked off from the faintly dull, very finely rugose temples. Antenna broken; segment 15 about one and a half times longer than wide; flagellum with somewhat bristly pubescence.

Mesoscutum strongly shining, with a weak, shallow punctation. Disc of scutellum strongly shining, polished except for a few, fine setiferous punctures. Metapleurum highly polished, impunctate. Venation hardly distinguishable from that of *mycetophilus*; edge of vannal lobe beyond its widest part imperceptibly concave and here without trace of fringe or projecting hairs. Hind coxa relatively larger than in *mycetophilus*, highly polished and almost without pubescence; hind tibia densely spinose but the spines along upper part shorter, less upstanding than those on lower part; hind tarsus short, thick, somewhat tapering apically.

Tergite 1 conspicuously grooved on each side as seen from above (Text-fig. 185); its horizontal surface finely roughened and with small, scattered punctures. Ovipositor sheath about one and one third times longer than the hind tibia; ovipositor rather thin, straight but down-curved at apex.

Length: ca. 3.2 mm. without ovipositor.

BORNEO: Sandakan, 1 ♀, the *TYPE*, (*Baker*).

Type in the U.S. National Museum.

Important for the recognition of this species is the colour and general appearance of tergite 1 in combination with the highly polished propodeum.

The two following species—*odites* and *inops*—form a natural unit, not at all closely related to any of the other elements in this somewhat artificial assemblage of species that I call the *mycetophilus*-group. Their main characters have been given in the first half of couplet 1 in the key. Both have small, inconspicuous claws.

***Apanteles odites* sp. n.**

♀. Legs, except the hind coxae, entirely yellow; hind tarsus very faintly infusate. Scape in greater part yellow. Wings faintly tinged with brown. Gaster predominantly yellowish-brown.

Face thickly, conspicuously punctate. Vertex between the ocelli and the eye margin sharply, discretely punctate, the punctures a little finer towards the frons; vertex between the ocelli and the rather small, polished occipital region with strong, sharp punctation. Antenna broken but the fifteen existing segments indicate that it is fully as long as the body; segment 15 fully twice as long as wide; flagellum decidedly bristly.

Mesoscutum with a dull satin-like sheen; thickly punctate, the punctures well separated, even along the course of the notaulices where they are slightly larger. Upper part of the propodeum with sharp, large punctures; around the orifice a considerable amount of rugosity, suggesting the beginnings of a U-shaped areola. Metacarp extremely long, almost closing their

radial cell ; abscissa 1 of the radius slightly longer than the transverse cubitus, the two veins distinctly angled at their junction.

Median field of tergite (2 + 3) longer than in any other species, except *inops*, included in the *mycetophilus*-group, highly polished (Text-fig. 189) ; rest of tergite (2 + 3) highly polished and with only sparse hairs across its apical part. Ovipositor sheath about one and one third times longer than the hind tibia, markedly falcate.

Length: ca. 3.2 mm. without ovipositor.

PHILIPPINES : Luzon, Mt. Makiling, 1 ♀, the *TYPE*, (*Baker*).

Type in the U.S. National Museum.

Apanteles inops sp. n.

♀. Remarkably like *odites* and in spite of the differences already mentioned in the key, *inops* may be only a small specimen of that species. Nevertheless, in view of the existence of these differences, I prefer to give the single female specific rank until further specimens and closer investigation enable a sounder conclusion to be drawn.

The thin antenna is as bristly as in *odites* ; segment 17 is fully one and a half times longer than wide.

PHILIPPINES : Luzon, Mt. Makiling, 1 ♀, the *TYPE*, (*Baker*).

Type in the U.S. National Museum.

Apanteles phaenna sp. n.

♀. A very dark species with the hind femur, especially on inner side, distinctly paler than the evenly dark brown hind tibia. Wings markedly smoky.

Head rather deep from back to front (Text-fig. 186). Face convex, virtually impunctate in type ; a distinct trace of punctation in the second female. Top of head smooth, with satin-like sheen. Posterior ocellus separated from the eye-margin by a distance equal to fully twice the longer diameter of the ocellus. Antenna thick and of powerful build, slightly longer than the body with the two preapical segments about one and a quarter times longer than wide ; the apical segment, and to a less extent segment 17, are paler than the rest of the antenna.

Mesoscutum faintly dull, its sculpture very fine and not resolvable. Propodeum with traces of weak rugosity. Claws large, well developed ; inner spur of the hind tibia not much longer than the outer one and hardly reaching the middle of the basal segment of the tarsus.

Tergite 1 very strongly narrowed behind and with a polished, completely differentiated tip (Text-fig. 188). Ovipositor sheath nearly one and a quarter times longer than the hind tibia, its hairs somewhat upstanding.

Length: ca. 2.4 mm. without ovipositor.

PHILIPPINES : Mdr. Or., Ilong, Mt. Halcon, 4,500 ft., ii.v.1954, 2 ♀♀, one the *TYPE*, (*M. & D. Townes*).

Type in Coll. Townes.

Apanteles pycnos sp. n.

This is a very distinctive species with strongly infumated, densely setose wings. Its relationship with *phaenna* may be less close than the superficial resemblance suggests. The form of tergites 1 and (2 + 3) is more like that of *mycetophilus* ; in *phaenna*, on the other hand, these two tergites bear a closer similarity to those of such species as *calycinae* and *iriarte*.

♀. It is convenient to compare *pyncos* with *phaenna*.

Head markedly transverse as in *mycetophilus* (cf. Text-fig. 192). Face virtually impunctate. Antenna relatively less powerfully built but its apex (3-4 segs.) very slightly thickened with the preapical segment not longer than wide and distinctly a little shorter on one side than the other ; no pale tip to the antenna ; flagellum slightly more bristly than in *phaenna*.

Mesoscutum somewhat dull, densely and, on the whole, sharply punctate. Disc of scutellum flattened, as in *phaenna*, its posterior margin separated from the polished posterior band of the scutellum by a row of sharp punctures ; hardly a trace of such punctures in *phaenna* and no trace at all in *mycetophilus* and *inunctus*. Propodeum with more rugosity above the posterior orifice and within the postero-lateral corners. Transverse cubitus strikingly long, relatively longer than in any other species included in the group ; distinctly longer than abscissa 1 of radius. Claws as well developed as in *phaenna*.

Tergite 1 and (2 + 3) (Text-fig. 190) ; the surface of tergite 1 is finely aciculate-rugose with scattered punctures where it turns over ; posterior smooth tip not occupying the whole of the apex as in *phaenna*. Ovipositor sheath about one and a third times longer than the hind tibia ; ovipositor straight, downcurved at tip.

Length: 3.5 mm. without ovipositor.

PHILIPPINES : Mdros. Or., Ilong, Mt. Halcon, 3,000 ft., 10.v.1954, 1 ♀, the *TYPE*, (M. & D. Townes).

Type in Coll. Townes.

This species and *phaenna* bear a strong resemblance to the Philippine species of the *nerion*-group. The resemblance may be just another example of a baffling convergence. But, nevertheless, if these Philippine species of the *nerion*-group lacked the percurrent propodeal furrow which is their distinctive feature, I should have had to include them among the heterogeneous members of the *mycetophilus*-group.

The membranous apical margin of tergites 4 and 5 is a striking feature of *pyncos*, though its true taxonomic value is hard to assess on a single specimen.

Apanteles lampe sp. n.

♀. Distinguishable from all the other species of the group by its large eyes (Text-fig. 184).

Hind femur and hind tibia brownish-red. Wings faintly tinted with brown. Whole body dark brown with a faint reddish tint.

Face smooth, impunctate. Head rather deep from back to front. Vertex between the ocelli and the eye-margin very faintly punctate and with satin-like sheen. Antenna broken but the existing 10 segments of flagellum thin and with long, bristly pubescence.

Mesoscutum faintly dull, with satin-like sheen and with fine sculpture not clearly resolvable as distinct punctation. Disc of scutellum strongly shining and with weak indication of punctation. Propodeum shiny, with some sort of rugosity almost everywhere. Fore wing not so densely setose at base as in *pyncos* and *phaenna* ; abscissa 1 of the radius slightly curved, not longer than the transverse cubitus. Legs relatively stouter and shorter than in *pyncos* and *phaenna* ; inner spur of the hind leg fully reaching middle of basal segment of tarsus ; claws strongly developed as in *pyncos* and *phaenna*. Vannal lobe beyond its widest part with sparse but distinctly projecting hairs.

Apical, polished lunule of tergite 1 occupying whole of tip, though transverse and not so sharply differentiated as in *phaenna*.

PHILIPPINES : Luzon, Mt. Makiling, 1 ♀, the *TYPE*, (Baker).

Type in the U.S. National Museum.

THE *LONGIPALPIS*-GROUP

Monobasic.

Apanteles longipalpis Reinhard

Apanteles longipalpis Reinhard, 1880 : 365, [in key only].

Apanteles longipalpis Reinhard, 1881 : 44, [description].

Nothing really separates this species from the *laevigatus*-group except the form of the mouth parts. I have given it group-status merely to emphasise this feature, since similar modifications have been used elsewhere in this work to throw into relief any deviation from the normal structural patterns found within *Apanteles*.

♀. Except for the base of the tibia, the hind legs are black almost throughout. Wings milky-white but the venation distal to the apex of the 1st abscissa of the medius pigmented ; stigma brown.

Head from front (Text-fig. 122). Flagellum thin, thread-like, shorter than body with segment 16 about twice as long as wide.

Mesoscutum highly polished except for minute setiferous punctures.

There is some variation in the shape of the 1st tergite, some specimens showing it less elongate, some more, than in Text-fig. 121. Ovipositor sheath about one and a half times longer than the hind tibia.

Length: ca. 4 mm. without ovipositor.

♂. One of the few species of *Apanteles* in which the male can be recognised ; the palpi are exactly as in the female.

EUROPE. In England, this species has been swept in numbers by R. L. E. Ford from *Achillea* (Compositae).

An unmistakeable species on account of the extraordinary mouth parts.

THE *LAEVIGATUS*-GROUP

Group U, Wilkinson, in part.

This group contains the majority of those solitary European species with long ovipositor and propodeum without either areola or medial keel and includes *laevigatus* (Ratzeburg).¹⁹ Certain species such as *dilectus* Haliday (Wilkinson, 1945) which Wilkinson included in his group U are probably better placed in my *ultor*-group. Replacements of this kind will be dealt with at a later date.

The edge of the vannal lobe is always more or less evenly convex and fringed throughout with minute hairs though these tend to be absent in the common European *sicarius* Marshall (Wilkinson, 1945).

THE *ACICULATUS*-GROUP

Monobasic.

Apanteles aciculatus (Ashmead)

Urogaster aciculatus Ashmead, 1900 : 289.

Pseudapanteles sancti-vincenti Ashmead, 1900 : 291 [Synonymy Muesebeck, 1908 : 431].

Apanteles thoracicus Muesebeck, 1920 : 534 [n. n. for *Pseudapanteles sanctivincenti* Ashmead, 1900 : 291 nec *Apanteles sanctivincenti* Ashmead, 1900 : 279].

¹⁹*Microgaster laevigatus* Ratzeburg, 1848 : 50.

♀. Hind femur and hind tibia dull reddish-yellow but both faintly darkened at extreme apex. Face almost smooth. Labium somewhat elongate. Eyes rather markedly convergent.

Side of pronotum with dorsal furrow. Mesoscutum somewhat dull by comparison with the polished vertex and temples, thickly punctate and with a tendency towards striate-punctuation posteriorly. Propodeum coarsely rugose-reticulate, without trace of areolation but with weakly indicated medial keel. Sternaulus deeply impressed, rugose. Metacarp hardly one and a half times longer than its distance from the apex of the radial cell; vannal lobe convex throughout and with conspicuous fringe; 1st abscissa of the discoideus very distinctly shorter than the 2nd. Inner spur of the hind tibia virtually not longer than the outer one and hardly reaching the middle of the hind basitarsus.

Tergite 1 one and a half times longer than its middle width, dull, densely rugose; tergite 2 with well defined lateral sulci delimiting a strongly transverse medial field, sculptured like tergite 1. Hypopygium membranous and with numerous lateral creases. Ovipositor sheath as long as the hind tibia.

WEST INDIES: St. Vincent.

Type in the British Museum (Nat. Hist.).

This group seems to show a certain affinity with the *butalidis*-group in general habitus, tendency to convergence in eyes, short metacarp, sculpture of propodeum and shape and sculpture of basal tergites.

THE *BUTALIDIS*-GROUP

I am not at all sure that this is a homogeneous group and I am putting into it a number of widely different species, which, however, with one exception, are linked by the common possession of a very short metacarp and a strongly rugose propodeum which shows no trace either of a medial keel or an areola.

The exception just referred to might almost be considered an aberrant member of the *laevigatus*-group because of its smooth propodeum. I am including it provisionally in the *butalidis*-group because of its strongly convergent eyes and short metacarp, a combination of characters that I have so far not met with in the *laevigatus*-group.

KEY TO SPECIES

FEMALES

- 1 Propodeum strongly shining, more or less smooth, polished; posterior, polished band of scutellum not interrupted at middle.

Eyes strongly convergent below (Text-fig. 204); mouth parts, mandibles, labrum and clypeus yellow; face more or less pale medially; stigma becoming pale proximal to middle; tergite 1 roundly narrowed behind; median field of tergite (2 + 3) markedly subtriangular; ovipositor sheath as long as the hind tibia; hind coxa almost yellow; hypopygium very long (Text-fig. 210); length: ca. 2.3 mm. without ovipositor

urgo sp. n.

EUROPE: E. Mediterranean, Crete, Canea, vii. 1906, 4 ♀♀, one the TYPE, (Biró).

Type in the Hungarian National Museum.

- Propodeum dull, evenly rugose all over; posterior, polished band of the scutellum more or less interrupted at middle by a patch of rugosity or area of punctuation.

Gaster densely pubescent; wings markedly brownish; tergite 1 and median field of (2 + 3) dull and both equally strongly rugose

- 2 Eyes very strongly convergent below (Text-fig. 212) ; mesoscutum and scutellum dull, rugose-punctate ; a large striate-rugose sternaulus present.

Median field of tergite (2 + 3) large, subquadrate, coarsely striate-rugose and almost as long as the rest of the segment beyond it (Text-fig. 203) ; ovipositor sheath about three quarters as long as the hind tibia ; labial palpus short, inconspicuous *butalidis* Marshall²⁰

EUROPE. Type in the Bignell Collection, Plymouth, England.

Host: Bred abundantly in England, Dorset, Portland by R. L. E. Ford from *Scythris senescens* Stn. (Scythridae).

- Eyes at most weakly convergent below and then the median field of tergite (2 + 3) is much shorter ; mesoscutum at most finely punctate ; sternaulus indicated only by a polished depression 3

- 3 Ovipositor sheath very short, hardly longer than the hind basitarsus and projecting beyond the apex of the gaster by a distance about equal to the 3rd segment of the hind tarsus ; tergite 1 short, slightly transverse, widened behind (Text-fig. 206).

Flagellum becoming yellowish on basal half ; hind coxa yellow but darkened at base on outer side ; flagellum slightly thickened at middle, its preapical segment about one and one third times longer than wide ; occiput rather deeply scooped out behind the ocelli, the polished depression contrasting sharply with the dull, rugulose temples and vertex *dion* sp. n.

EUROPE: Czechoslovakia, Moravia, Mohelno, 1 ♀, the TYPE, (Z. Bouček). Type in the National Museum, Prague.

This is a highly aberrant species and I am not satisfied that I am correct in placing it in the *butalidis*-group.

- Ovipositor sheath much longer, at least three quarters as long as the hind tibia ; tergite 1 longer than wide and at least slightly narrowed behind.

Legs predominantly dark, the hind coxa and hind femur blackish 4

- 4 Ovipositor sheath very slightly longer than the hind tibia.

Hind tibia brownish yellow but becoming darkened on about apical quarter ; mesoscutum shiny and with a faint, hardly noticeable punctation ; pubescence of face and clypeus pale, greyish-white ; ovipositor thin, almost straight ; tergite 1 markedly narrowed behind ; lateral corners of median field of tergite (2 + 3) narrowly drawn out (Text-fig. 205) ; length: ca. 3 mm. without ovipositor

crantor sp. n.

EUROPE: E. Mediterranean, Crete, Mt. Ida, 1906, 5 ♀♀, one the TYPE ; Herakleion, 3 ♀♀, 5.v.1906. ASIA MINOR, Angora, 1 ♀, 13.vi.1925, (All Biró). Type in the Hungarian National Museum.

- Ovipositor sheath distinctly shorter than the hind tibia 5

- 5 Median field of tergite (2 + 3) with narrowly drawn out lateral corners as in *crantor* (cf. Text-fig. 205).

Legs paler than in the following species ; eyes distinctly more convergent below (Text-fig. 207) *evander* sp. n.

EUROPE: Finland, Hailuoto, Wuorentaus, 1 ♀, the TYPE ; Tytärsaari, 1 ♀, (Hellén). Type in the Helsinki Museum.

This species resembles *crantor* in the shape of the basal tergites of the gaster but lacks the somewhat elongate head of *crantor* as seen in a facial view. The hind tibia, as in *crantor*, is pale brownish yellow with faintly darker tip.

Median field of tergite (2 + 3) with less narrowly drawn out lateral corners and hence approaching more the shape of a strongly transverse rectangle (Text-fig. 211).

Very black-looking species with the hind tibia entirely dark brown and the ovipositor thicker than in both *crantor* and *evander* ; mesoscutum more clearly punctate

²⁰ *Apanteles butalidis* Marshall, in André 1888 : 450.

Apanteles butalidis Marshall ; Wilkinson, 1945 : 194.

than in either of these two species and tergite 1 shorter and less obviously narrowed behind ; the head in a facial view is more like that of *crantor* than *evander*, the eyes being not at all convergent below ; the pubescence of the face is dark brown

cloelia sp. n.

SWITZERLAND: Valais, Arolla, 21-30.vi.1935, 8 ♀♀, one the TYPE (29.vi.), (J. E. & R. B. Benson). Type in the British Museum (Nat. Hist.).

MALES

I associate with the females of *crantor*, seven males from the same two Cretan localities. Also, I associate with *cloelia*, nine males with the same data as the females. These two series of males are beyond doubt different and confirm the specific validity of the two species. There is a marked difference in the shape of the penis-valve ; in *crantor* it is narrow and evenly oval as seen from above (Text-fig. 209) while in *cloelia*, the structure is relatively larger, broad medially and rather abruptly narrowed to apex (Text-fig. 208). I have seen no male that I can with confidence associate with *evander*, a species that in several respects is intermediate between *crantor* and *cloelia*.

The male of *butalidis* lacks the convergent eyes of the female and differs from the males of *crantor* and *cloelia* in having almost hyaline wings and the coarse mesoscutal sculpture of its female.

THE FALCATUS-GROUP

Apanteles falcatus, the common and sole European representative species of this group has usually been placed among the species that constituted Wilkinson's group A and Marshall's section IV. I do not consider the relationship to be as close as these authors believed.

The genital apparatus of the male of *falcatus* and of *caudatus* is remarkable on account of its relatively enormous size. There is no approach to this in any other group of *Apanteles* known to me.

The group is represented in N. America by three species, two of which are extremely close to *falcatus*.

KEY TO SPECIES

FEMALES

- 1 Ovipositor sheaths bright reddish-yellow, only about two thirds as long as the hind tibia.

Gaster, except at base and apex, and the legs throughout, bright reddish-yellow ; propodeum with well defined, medial keel ; inner spur of the hind tibia not longer than the outer one ; tergite 1 dull, densely rugose ; median field of tergite (2 + 3) more triangular than in the other species

cinctiformis Viereck²¹

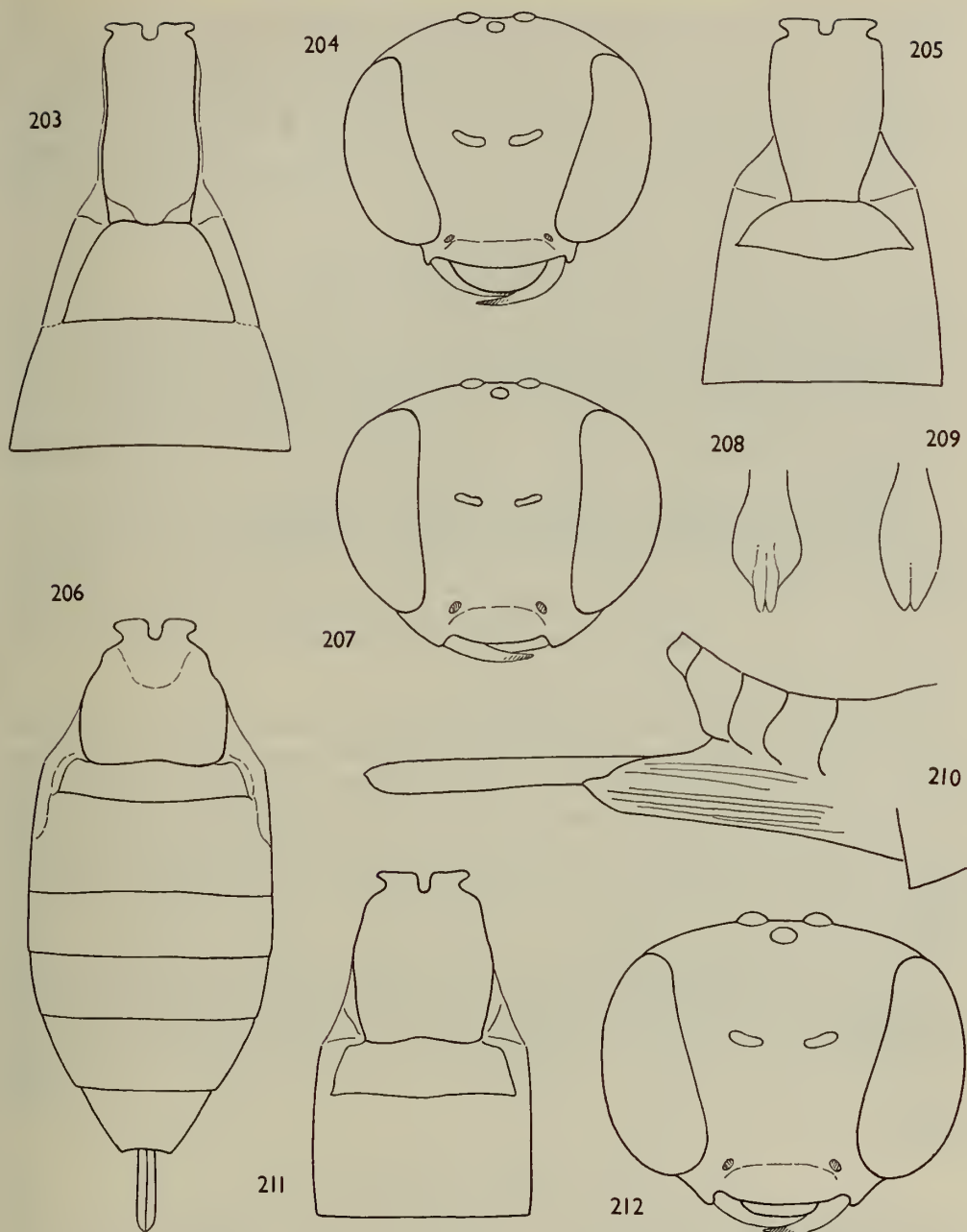
N. AMERICA. Type in the U.S. National Museum. 1 ♀, 1 ♂ in British Museum (Nat. Hist.) determined by Muesebeck.

The genitalia of the male, though relatively large for *Apanteles*, are by no means so large and exaggerated in appearance as in *falcatus* ; nevertheless, the paramere, as in *falcatus*, is widely truncate at apex with the upper corner more pointed than the lower one. The female is remarkably distinct because of its pale ovipositor sheaths, a colour feature I have not so far met with elsewhere in *Apanteles*. The species is not closely related to *falcatus* and *caudatus*, lacking the characteristic appearance of the basal tergites peculiar to these two species.

- Ovipositor sheaths black and at most only a little shorter than the hind tibia 2

²¹*Apanteles (Protapanteles) cinctiformis* Viereck, 1911 : 176.

Apanteles cinctiformis Viereck ; Muesebeck, 1920 : 526.



FIGS. 203-212. *Apanteles*: 203, *butalidis* Marshall, basal tergites; 204, *urgo* sp. n., head, from in front; 205, *crantor* sp. n., basal tergites; 206, *dion* sp. n., gaster, dorsal; 207, *evander* sp. n., head, from in front; 208, *cloelia* sp. n., ♂, aedeagus; 209, *crantor*, sp. n., same; 210, *urgo* sp. n., ovipositor and hypopygium; 211, *cloelia* sp. n., basal tergites; 212, *butalidis* Marshall, head, from in front.

- 2 Mesoscutum, except right in front, highly polished and virtually impunctate ; hind coxa reddish-yellow except at base ; apical segments of the antenna longer, segments 16-17 being between one and a half and one and two thirds times longer than wide ; hypopygium narrowly tapered in profile and clothed beneath thickly with long, bristle-like hairs ; ovipositor slightly thicker, its sheath slightly shorter and wider than in *falcatus* *caudatus* Muesebeck²²

I have recognised this species from its description. Muesebeck describes the male, unknown to me, as having enormous claspers.

N. AMERICA. In the British Museum (Nat. Hist.) are 1 ♀ from Wisconsin (gaster, except for the plate of tergite 1, the median field of tergite (2 + 3) and extreme posterior tip, bright reddish-yellow) and four females from Labrador ; these have almost the whole of the upper surface of the gaster darkened.

- Mesoscutum distinctly though finely punctate all over ; hind coxa entirely dark ; apical segments of the antenna shorter, slightly thicker, segments 16-17 being from one and one third times to one and a half times longer than wide ; hypopygium not thus tapered and only sparsely clothed beneath with bristle-like hairs that are shorter than in *caudatus* ; ovipositor slightly thinner, its sheaths distinctly longer and slightly less wide than in *caudatus* (basal tergites, Text-fig. 233) . . . *falcatus* (Nees)²³

EUROPE.

Host: *Hadena monoglypha* Hufnagel (Noctuidae). A gregarious parasite, making a tightly packed cluster of cocoons arranged parallel to each other.

Apanteles neomexicanus Muesebeck

Apanteles neomexicanus Muesebeck, 1920 : 529.

This species, represented in the British Museum by a paratype without antennae, is extremely like both *falcatus* and *caudatus*, occupying a position midway between them. The hind coxa is evenly brown and the general coloration is otherwise like that of *falcatus*. The surface of the mesoscutum is slightly more punctate than that of *caudatus* but not so distinctly as in *falcatus* ; the ovipositor sheaths are as long as in *caudatus* ; the hypopygium is less narrowed apically than in *caudatus* but more so than in *falcatus* ; it is as densely clothed beneath with long bristle-like hairs as in *caudatus*.

I hesitate to express a definite opinion on the specific validity of *neomexicanus* on a single specimen in rather poor condition. Clearly, this species, together with *falcatus* and *caudatus*, are in need of further study. All I have tried to do is to indicate the closeness of their relationship. *A. neomexicanus* was described from New Mexico, Santa Fé and Muesebeck gives the species as " apparently solitary, making a white cocoon ".

THE OCTONARIUS-GROUP

The species of this group known to Wilkinson were all included by him in his group A. The greater part of this group I have now broken down into an *octonarius*- and a *vitripennis*-group. These two segregates are certainly closely related and the

²²*Apanteles caudatus* Muesebeck, 1922 : 16.

²³*Microgaster falcatus* Nees, 1834 : 175.

Apanteles falcatus (Nees) Reinhard, 1880 : 364.

only valid character for separating them is provided by the venation as pointed out in couplet 33 of the key. The essential features of the *octonarius*-group have also been given in the key ; there is nothing to add.

So far, I am acquainted with only two European species, *octonarius* (Ratzeburg)²⁴ and *inclusus* (Ratzeburg)—but the group is world-wide in distribution and Wilkinson described several species from the Indo-Malayan region.

THE *VITRIPENNIS*-GROUP

I have used the name “*vitripennis*”²⁵ to designate the group because it is the first of the typical species mentioned by Haliday and was used by Wilkinson (1932b, 330) for a subdivision of his major group A. Wilkinson’s subgroup of *vitripennis* was much wider in concept than my own definition of the whole *vitripennis*-group as now introduced (see Text-figs. 129 and 152).

The commonest species of the group and in many ways the most representative is the abundant and gregarious *fulvipes* Haliday, with a wide range over Europe.

The species of the group bear a close resemblance in general habitus to certain segregates in *Protomicroplitis*, such as the groups of *marginatus* and *calceatus*. Whether this resemblance is due to convergence or is really an indication of genuine evolutionary relationship is a matter on which, at the moment, I am not prepared to express an opinion.

THE *PALLIPES*-GROUP

Apanteles pallipes Reinhard

Apanteles pallipes Reinhard, 1880 : 366 [in key].

Apanteles pallipes Reinhard ; Reinhard, 1881 : 48 [description].

Apanteles reinhardi Wilkinson, 1936a : 222. **syn. n.**

Apanteles pallipes has very much the facies of the species of the *vitripennis*-group and is separable from that group only on the presence of the propodeal keel and the virtually undefined lateral pronotal keel. The median field of tergite (2 + 3) is longitudinally rugose-striate throughout and is obviously triangular in shape.

On the material available to me in the British Museum (Nat. Hist.), I do not believe *reinhardi* Wilkinson to be more than large, better nourished specimens of *pallipes*.

EUROPE.

Type of *pallipes* in the Reinhard collection, Zoologisches Museum der Universität, Berlin. Type of *reinhardi* in the British Museum (Nat. Hist.).

Host : *Plusia* spp.:—*P. chrysitis* L., *P. gamma* L., *P. pulchrina* Haworth.

Reinhard originally described *pallipes* as a parasite of *Plusia gamma* and the

²⁴*Microgaster octonarius* Ratzeburg, 1852 : 52.

Apanteles octonarius (Ratzeburg) Reinhard, 1880 : 364.

Apanteles octonarius (Ratzeburg); Wilkinson, 1945 : 127.

²⁵*Microgaster vitripennis* Haliday, 1834 : 248.

Apanteles vitripennis (Haliday) Reinhard, 1880 : 366.

Pyralid, *Botys verticalis* Hübner. This latter record may well be wrong. The species is gregarious and more or less completely hides its mass of cocoons in a ball of flocculent silk.

It is highly probable that this species is not distinct from the N. American *longicornis* Provancher. There are four specimens of *longicornis* in the British Museum, all females and determined by Muesebeck. Apart from having the propodeal keel slightly less well defined, there is nothing to separate them from *pallipes*. Without seeing further specimens and in the absence of information concerning host and cocoons, I hesitate to say that the name "*longicornis*" should give way to "*pallipes*".

The male of *pallipes* is distinctive in that the claspers are obliquely truncate at apex, each clasper being sharply pointed at apex above. A similar modification occurs in species of the *vitripennis*-group.

THE CONGOENSIS-GROUP

Ocelli in a rather high triangle, the transverse, posterior tangent to the anterior ocellus passing slightly in front of the posterior pair. The antenna of the female tends to be very short but it is possible that the length of the segments may vary within wider limits than I have allowed for.

Especially important for the recognition of the group is the long, inner spur of the hind tibia. It is only on this character and the absence of the lateral pronotal furrow that separation from some elements of the *octonarius*-group, such as *thompsoni* Lyle (1927), is possible. Distribution : Old World.

KEY TO SPECIES

FEMALES

- 1 Propodeal spiracle very large, separated from the posterior corner of the propodeum by a distance not greater than its own diameter.

Antenna very short, hardly longer than head plus thorax ; flagellum slightly thickened in the middle with at least the middle segments not longer than wide ; flagellum very bristly (Text-fig. 215) ; mesoscutum highly polished, impunctate and only sparsely hairy except right in front ; metacarp hardly longer than the broad stigma (Text-fig. 219) ; tergite 2 with shining, transverse, triangular field that shows faint rugosity towards sides ; ovipositor sheath short, blunt, hardly projecting beyond the short hypopygium ; hind tarsus very short, segment 4 being very little longer than wide (Text-fig. 215) *congoensis* de Saeger²⁶

BELGIAN CONGO. UGANDA. Type in the Congo Museum, Tervuren.

Host: *Dichocrocis crocodera* Meyrick (Pyraustidae), on coffee. Gregarious. Cocoons white, loosely heaped together.

The species is easily recognised by the large propodeal spiracles.

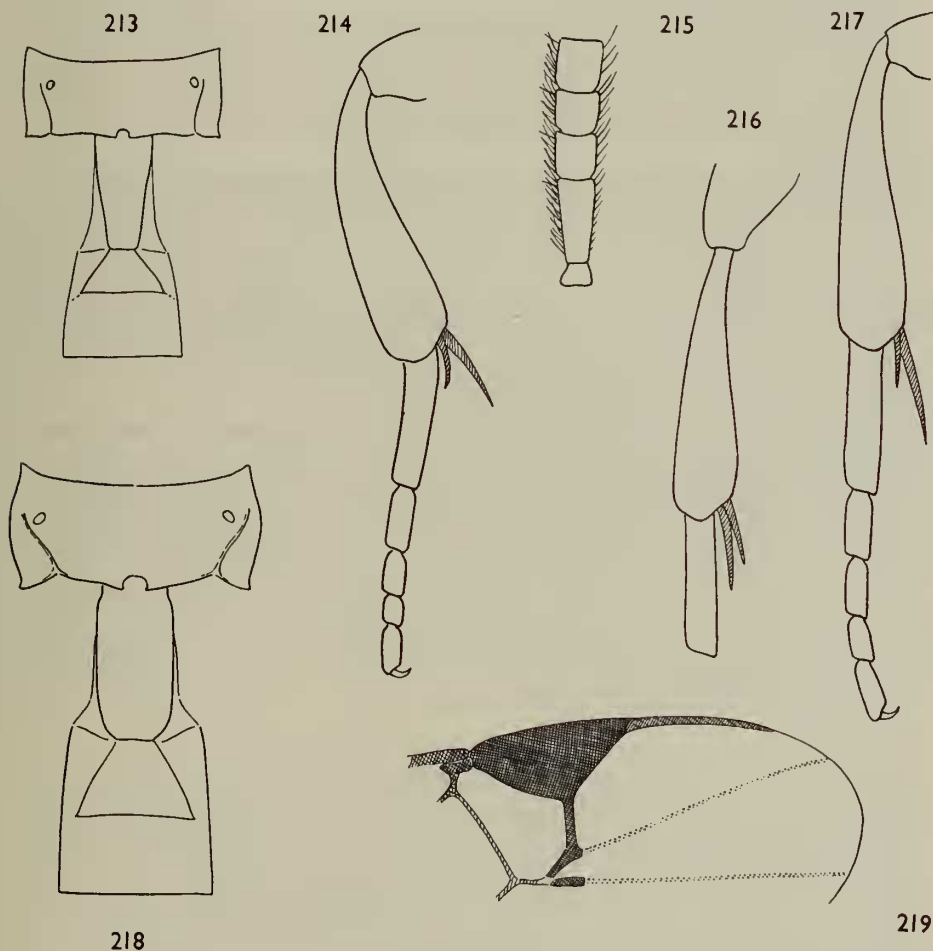
- Propodeal spiracle of normal size ; flagellum not bristly, its pubescence short, dense and of ordinary appearance ; hind tarsus longer, segment 4 being more obviously longer than wide 2
- 2 Thorax strongly flattened.

²⁶*Apanteles congoensis* de Saeger, 1941 : 344.

Tergite 1 narrower and still more narrowed behind than in *congoensis*; median field of tergite 2 highly polished, less well delimited and less transversely triangular than in *congoensis*; metacarp longer in relation to the stigma than in *congoensis*; inner spur of the hind tibia almost three quarters as long as the hind basitarsus (Text-fig. 217); wings hyaline 3

Thorax not flattened.

1st abscissa of the discoideus much shorter than the 2nd; vannal lobe with distinct marginal fringe 4



FIGS. 213-219. *Apanteles*, ♀: 213, *pyrogrammae* sp. n., propodeum & basal tergites; 214, *congoensis* de Saeger, hind tibia and hind tarsus; 215, *congoensis*, same, basal four flagellar segments; 216, *parmula* sp. n., hind tibia and spurs; 217, *plancina* sp. n., hind tibia and hind tarsus; 218, *astydamia* sp. n., propodeum and basal tergites; 219, *congoensis* de Saeger, fore wing, part.

- 3 Flagellum short, thick, with all the segments, except the first and the last, hardly longer than wide ; front tarsal segment 5 without a spine ; thorax broader ; tergite 1 less narrow ; hind coxa red.

Thorax much flattened ; tergite 1 and 2 almost yellowish and resembling the legs in colour ; flagellum pale but darkened apically ; hind tibia and hind tarsus (Text-fig. 217) *plancina* sp. n.

INDIA: Punjab, Miranpur, iv.1938, 3 ♀♀, 3 ♂♂, Chichawatni, viii.1928, 2 ♂♂, ex *Plectoptera reflexa* v. 5 ♂♂, 3 ♀♀, Terah Plain, iv.1 ♂, Daphar Plain, v.1938, 1 ♂, Arafwala Plain, v.1938, 1 ♀, Shikapur, Newman Plain, v.1938, 1 ♀ ; United Provinces, Allahabad, 3.iv.1938, 1 ♀, the *TYPE*, ex *Cacoecia* sp.. All the above material bred in association with the *Dahlbergia sissoo* entomological survey. Type in the British Museum (Nat. Hist.).

Host: *Plectoptera reflexa* Guen. (Phalaenidae), *Cacoecia* sp. (Tortricidae).

The males of *plancina* are much darker than the females and are sometimes nearly black ; the antenna is considerably longer the body. In most females there is a contrast between the paler base of the gaster and the rest of the body but sometimes the pale colour is more extensive and the whole insect becomes predominantly reddish yellow.

- Flagellum longer, slender, all the segments longer than wide ; front tarsal segment 5 with a fine spine ; thorax less broad ; tergite 1 more slender (Text-fig. 213) ; hind coxa pale only towards apex.

Thorax entirely black *pyrogrammae* sp. n.

NEW GUINEA: Lae, xii.1957, 1 ♀, the *TYPE*, 1 ♂ ; Rabaul, vii.ix. 2 ♀♀ ; Bougainville, v.1960, 1 ♀, all bred from *Agonoxena pyrogramma*, (R. W. Paine).

AUSTRALIA: Queensland, Tully, ii.1961, 4 ♀♀, ex *Agonoxena pyrogramma* (R. W. Paine). Type in the British Museum (Nat. Hist.).

Host: *Agonoxena pyrogramma* Meyrick (Agonoxenidae).

- 4 Wings distinctly smoky ; metacarp short, not at all longer than the stigma and hardly two and a half times as long as its distance from the apex of the radial cell.

Stigma short, broad, as in *congoensis* (cf. Text-fig. 219) ; median field of tergite 2 much shorter than 3 and strongly transverse with weak oblique aciculation laterally ; flagellum as in *congoensis* but with simple pubescence and the segments lacking the somewhat moniliform appearance of those of *congoensis* ; hind legs as in *congoensis* ; hypopygium blackened and heavily sclerotised, altogether more strongly developed than in *congoensis* ; ovipositor sheath broadly truncate ; inner spur of the hind tibia only just reaching beyond the middle of the hind basitarsus and only a little longer than the outer one (Text-fig. 216) *parmula* sp. n.

S. AFRICA: Cape Province, Ceres, iv.1925, 1 ♀, the *TYPE*, (R. E. Turner). Type in the British Museum (Nat. Hist.).

I doubtfully associate with this species a second female (Mossel Bay, xii, (R. E. T.), in which the wings are not smoky and the stigma is slightly less broad ; also the face is slightly more transverse and slightly duller by reason of a very superficial but coarse punctation. This specimen may belong to a further species, closely allied to *parmula*. The short metacarp and the shape of the median field of tergite 2 are both important for the recognition of *parmula*.

- Wings not at all smoky ; metacarp less short, distinctly longer than the stigma and longer in proportion to its distance from the apex of the radial cell ; median field of tergite 2, though poorly defined, less transverse.

Inner spur of the hind tibia longer in proportion to the length of the hind basitarsus and also longer in proportion to the length of the outer spur 5

- 5 Antenna longer, not noticeably tapering towards apex and with flagellar segments 4-7 at least one and a half times longer than wide ; tergite 1 narrower, pale only at base ; median field of tergite 2 hardly transverse (Text-fig. 218) *astydamia* sp. n.

S. AFRICA: Louis Trichardt, 5 ♀♀, one the *TYPE*, 1 ♂, bred iv.1935, ex larva *Epichorista ioniephala*. Type in the British Museum (Nat. Hist.).

Host: *Epichorista ioniephala* Meyrick (Tortricidae).

The antenna of the male is shorter and thinner than that of the Indian *plancina* and the wings show no sexual dimorphism.

- Antenna shorter, noticeably tapering towards apex and with flagellar segments 4-7 only one and a quarter times longer than wide ; tergite 1 wider, evenly reddish throughout ; median field of tergite 2 much more obviously transverse

symmysta sp. n.

S. AFRICA: Pondoland, Port St. John, 12-30.vi.1923, 1 ♀, the *TYPE*, (*R. E. Turner*), Transkei, Umtata, 18.ii-18.iii.1923, 1 ♀, (*R. E. T.*). Type in the British Museum (Nat. Hist.).

This species has the face smoother than *parmula* ; both species need further study.

THE *FORMOSUS*-GROUP

The species of this group seem to be all closely and naturally related with regard to the main characters by which I have segregated them. But within the group specific divergences are fairly wide. Salient features are the following:-

Side of pronotum without trace of a dorsal furrow. First abscissa of the discoideus considerably shorter than the second, usually about half as long ; always a distinct angle between the 1st abscissa of the radius and the transverse cubitus ; vannal lobe beyond its widest part with straight or slightly concave edge and here without a distinct fringe of projecting hairs (but cf. *gratiosus* Wilk.). Apical segment of the front tarsus of the female often with a spine. Tergite (2 + 3) either without a median field and with two short sulci directed towards the lateral margin of the segment (*formosus* Wesm., Text-fig. 228) or, if median field is present then this is obviously triangular. Hypopygium evenly sclerotised all over. Ovipositor short, more or less concealed.

Old and New World. Not rich in species ; most of those known to me are from Africa.

A. cuspidalis de Saeger (1944) and *A. simulissimus* de Saeger (1944) almost certainly belong here but are not included in the key, as I have not seen them.

KEY TO SPECIES

FEMALES

- 1 Eyes very large so that the face is longer than wide ; posterior ocellus separated from the eye-margin by a distance not greater than the longer diameter of the ocellus 2
- Eyes smaller, of normal size, the face in consequence not longer than wide ; posterior ocellus separated from the eye-margin by a distance equal to at least nearly twice the longer diameter of the ocellus 3
- 2 Thorax, except for the almost yellow pronotum and propleurum, brownish ; posterior ocellus separated from the eye-margin by about its longer diameter ; 1st abscissa of the discoideus hardly half as long as the 2nd ; apical segment of the front tarsus without trace of a spine.

Antenna very slender, the preapical segment fully three times as long as wide ; tergite 1 parallel-sided, about twice as long as wide, yellowish-red, more especially

towards base ; apically, tergite 1 is coloured more or less like tergite (2 + 3) ; incomplete sulci of tergite 2 directed towards the *posterior* margin of the segment so that a weakly indicated subtriangular median field is present, bordered by feeble aciculation ; hypopygium not strongly developed, in profile subtruncate

belliger Wilkinson²⁷

MAURITIUS: St. Pierre. Type in the British Museum (Nat. Hist.).

Host: *Cirphis unipunctata* Haworth (The Army Worm, Noctuidae).

In general habitus and on the form of tergite 1 and 2, together with the disposition of the sulci of tergite 2, more closely related to *gratiosus* Wilkinson than to any other species.

- Thorax, except for the propodeum and sides behind, entirely reddish-yellow ; posterior ocellus separated from the eye-margin by a distance equal to about half its longer diameter ; (Text-fig. 229 ; 1st abscissa of the discoideus about two thirds as long as the 2nd ; apical segment of the front tarsus with a conspicuous spine (Text-fig. 223), the segment emarginate opposite to the spine and the segment itself medially constricted.

Gaster, except for the apical half of tergite (2 + 3) and tergites 4-6, entirely reddish-yellow ; legs reddish-yellow except that the hind femur and hind tibia are faintly tipped with infuscation ; flagellum very slender, the preapical segment about three and a half times longer than wide ; tergite (2 + 3) with short sulci directed towards the apical corner of tergite 2 (this being defined by the weak 2nd suture) and suggesting a triangular field that is more transverse than in *belliger*. Hypopygium short

teapae sp. n.

MEXICO: Teapa, Tabasco, iii, 1 ♀, the *TYPE*, (*H. H. Smith*). Type in the British Museum (Nat. Hist.).

- 3 Front tarsal segment 5 modified, being constricted at middle and hence in appearance bipartite ; beneath, it is armed with a strong, curved spine ; the surface opposite the spine is feebly emarginate.

1st abscissa of the discoideus fully two thirds as long as the 2nd 4

- Front tarsus 5 not thus modified, at most with a feebly thickened hair beneath and then there is no emargination opposite to it 5

- 4 Mesoscutum bicoloured, being brown with pale testaceous bands along the imaginary course of the notaulices ; ocelli nearly in an equilateral triangle, the distance between the posterior pair being about one and one third times as great as the diameter of the median ocellus ; scutellum showing feeble and normal convexity ; face with vague indication of coarse punctation ; hind tibia without a prickly appearance, the spines being pale, rather short and not particularly upstanding ; incomplete sulci of tergite 2 directed vaguely towards the posterior corners of the segment.

Brightly coloured species with the pronotum and propleurum as pale as the paler parts of the mesoscutum ; mesoscutum sharply punctate ; claws less strongly lobed than in *formosus* (cf. Text-fig. 222) ; hypopygium of moderate development

maia sp. n.

S. AFRICA: Pondoland, Port, St. John, 10-31, vii.1923, 1 ♀, the *TYPE*, 12-20, vi. 1923, 1 ♀, (*R. E. Turner*). Type in the British Museum (Nat. Hist.).

Characterized by the form of the apical segment of the front tarsus in combination with colour.

- Mesoscutum entirely black ; ocelli in a lower triangle, the distance between the posterior pair being obviously greater than the diameter of the median ocellus, about one and two thirds times as great ; scutellum strongly domed ; incomplete sulci of tergite 2 directed towards the middle of the side of the tergite ; hind tibia having a prickly appearance, its spines longer, sharper, and much more upstanding

²⁷ *Apanteles belliger* Wilkinson, 1929a : 107.

than in *maia* ; face virtually without a trace of punctation.

Tergite 1 and sides of 2, outside the area delimited by the sulci, bright yellow ; hypopygium short, subtruncate (Text-fig. 227) ; tergite 2 medially only about two thirds as long as 3 ; (Text-fig. 228) ; 1st abscissa of the discoideus longer in proportion to the 2nd than in *maia* ; front tarsus 5 (Text-fig. 222)

formosus (Wesmael)²⁸

EUROPE.

Host: *Abraxas sylvata* Scopoli, *Abraxas grossulariata* L., *Biston hirtaria* Clerck (Geometridae). Solitary. The larva, on leaving its host, makes a pedunculate, pensile cocoon, a habit unique in the Microgasterinae so far as is known.

- | | | |
|---|---|----|
| 5 | Ocelli in a triangle with base very distinctly longer than sides, the distance between the posterior pair being very obviously greater than the diameter of the median ocellus | 6 |
| - | Ocelli in a triangle that is almost equilateral, the distance between the posterior pair being virtually not greater than the diameter of the median ocellus | 11 |
| 6 | Sulci of tergite 2 almost horizontally placed and directed towards the lateral margin of the tergite ; 1st abscissa of the discoideus about two thirds as long as the 2nd, somewhat shorter in <i>geometrivorus</i> | 7 |
| - | Sulci of tergite 2 more obliquely placed and directed towards the posterior corner of the tergite ; 1st abscissa of the discoideus hardly more than half as long as the 2nd. | |

Medium brown species with the hind coxa and tergite 1 entirely yellow ; incomplete sulci of tergite 2 deeply marked at their origin ; this tergite shows no aciculation ; hind tarsus somewhat short in relation to its tibia, very bristly and the flange along ventral surface of segments 1-4 deep and conspicuous ; mesoscutum on posterior half becoming less hairy and highly polished ; anteriorly the surface of the mesoscutum is sharply punctate ; the lateral keel of the propodeum meets the posterior keel at a well defined angle ; propodeum itself short (Text-fig. 225)

cerales sp. n.

UGANDA: L. Victoria, Sesse Is., ix.1912, 9 ♀♀, one the TYPE, 3 ♂♂, (*G. D. H. Carpenter*). Type in the British Museum (Nat. Hist.).

Host: caterpillar with hairs and bristles, probably Arctiid. Gregarious with white cocoons closely heaped in dense, somewhat cottony mass.

- | | | |
|---|--|---|
| 7 | Hind coxa entirely yellow | 8 |
| - | Hind coxa black or dark brown | 9 |
| 8 | Hypopygium in profile acutely pointed, angled at about 45 degrees ; lateral, excavate area of scutellum virtually unsculptured ; front claws large and with a deep, narrow cleft between the lobe and the end of the claw ; hairs of the median cell numerous and evenly distributed ; lateral keel of the propodeum completely interrupted by the spiracle ; tergite 2 more transverse, only about two thirds as long as 3. | |

Thorax medium brown ; hind tibia having a very bristly appearance, the spines of the outer side being strong

pompelon sp. n.²⁹

JAPAN: Sapporo, 1 ♀, the TYPE. Type in the British Museum (Nat. Hist.).

Host: The type bears a label: 'Wirt, *Porthesia similis* Fuess.'

This is the only species of the group known to me in which the spiracle of the propodeum completely interrupts the lateral keel but the value of this character cannot be adequately assessed on a single specimen.

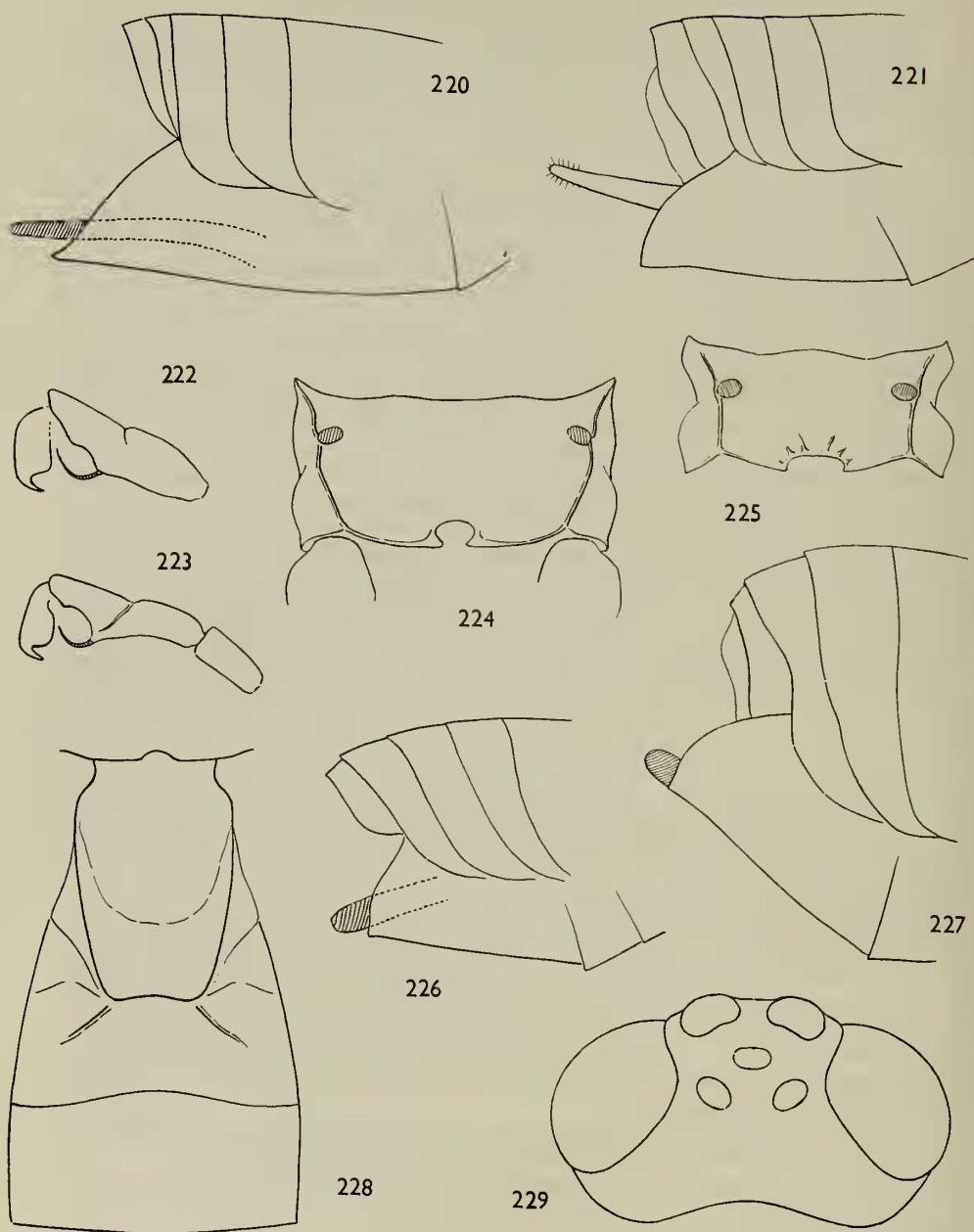
- Hypopygium in profile almost right angled (Text-fig. 220) ; lateral, excavate area of scutellum showing normal rugosity ; front claws small and not easily seen, without

²⁸ *Microgaster formosus* Wesmael, 1837 : 60.

Apanteles formosus (Wesmael) Reinhard, 1880 : 366.

Apanteles formosus (Wesmael) ; Wilkinson, 1945 : 95.

²⁹ *Apanteles bicolor* Nees ; Watanabe 1937 : 122 [nec Nees, 1834].



FIGS. 220-229. *Apanteles*, ♀: 220, *gratiosus* Wilkinson, apex of gaster, lateral; 221, *sancus* sp. n., same; 222, *formosus* (Wesmael), apical segment of front tarsus; 223, *teapae* sp. n., same; 224, *tormina* sp. n., propodeum; 225, *cereales* sp. n., propodeum; 226, *papilionis* Viereck, apex of gaster, lateral; 227, *formosus* (Wesmael), same; 228, *formosus* (Wesmael), basal tergites; 229, *teapae* sp. n., head, from above.

basal lobe and hence without cleft ; hairs of the median cell becoming sparse and absent along the medius side ; lateral keel of propodeum not interrupted by the spiracle though sometimes nearly touched by it ; tergite 2 less transverse, nearly as long as 3.

Antenna not longer than the body and in this respect resembling that of *geometrivorus* but not the other species of the group ; thorax virtually black and the mesoscutum much polished, virtually impunctate even in front ; hind tibia less bristly than in *pompeloni* ; tergite 1, and 2 almost entirely, bright yellow ; tergite 1 tends to be rather deeply and widely excavate anterior to its turned over posterior part *papilionis* Viereck³⁰

INDIA. MALAYA.

Type in the U.S. National Museum.

Host: *Papilio agamemnon* L., *Papilio demoleus* L. (Papilionidae).

- 9 Stigma unusually broad ; ovipositor sheath straight, slightly narrowed apically, projecting freely beyond the short hypopygium (Text-fig. 221).

Tergite 1 dull reddish ; membranous sides of this tergite and of tergite (2 + 3) yellow ; tergite 2 with distinct, oblong, raised, median swelling ; this tergite, in its relation to tergite 3, like that of *formosus* (cf. Text-fig. 228) ; preapical segment of the antenna about one and a half times longer than wide *sancus* sp. n.

FRANCE: Montpellier, x.1923, 3 ♀♀, one the TYPE, 1 ♂, (*J. Suire*). Type in the British Museum (Nat. Hist.).

Host: *Lycaena* sp. Gregarious, there being six papery cocoons, packed closely together.

This distinct species has the stigma broader than in any other.

- Stigma of normal form ; ovipositor sheath not projecting so freely beyond the apex of the hypopygium 10
- 10 Tergite 2 half as long as 3 ; hairs of the median cell very sparse and absent along the medius side ; most of the venation proximal to the areolet pale and almost unpigmented ; tergite 1 entirely bright yellow ; antenna a little shorter, the preapical segment hardly more than one and a half times longer than wide ; hypopygium short, almost truncate in profile ; tergite 1 broader, more polished and hollowed out anteriorly, exactly like that of *papilionis* *geometrivorus* de Saeger³¹

AFRICA: Belgian Congo (type locality). UGANDA. Type in the Congo Museum, Tervuren.

Host: Green and yellow Geometrid on *Cajanus indicus*. Gregarious with brown cocoons piled on dead host.

This species is extremely like *papilionis*, differing only in the length of tergite 2 in relation to that of 3.

- Tergite 2 fully two thirds as long as 3 ; hairs of the median cell more numerous and evenly distributed ; venation pigmented everywhere ; tergite 1 reddish but infuscated on its turned over posterior part ; this tergite longer than in *geometrivorus* and showing a certain amount of apical roughening ; antenna longer, the preapical segment fully twice as long as wide ; hypopygium longer, sharply pointed, angled at about 45 degrees.

Posterior, polished band of the scutellum unusually wide, almost as wide as in *formosus* to which this species is probably more closely allied than to *geometrivorus*

anthedon sp. n.

S. AFRICA: Transvaal, Belfast, vi.1938, 23 ♀♀, one the TYPE, 1 ♂, (*F.G.C. Tooke*). Type in the British Museum (Nat. Hist.).

³⁰*Apanteles* (*Protapanteles*) *papilionis* Viereck, 1912 : 145.

Apanteles papilionis Viereck ; Wilkinson, 1928 : 81.

³¹*Apanteles geometrivorius* de Saeger, 1941 : 331.

Host: *Euproctis terminalis* Walker (Lymantriidae). Gregarious with cocoons whitish and loosely heaped together.

This is a dark species largely characterized by the broadness of the posterior, polished band of the scutellum.

- 11 Vertex and temples sharply and very characteristically punctate; mesoscutum almost all over densely, sharply punctate.

Occiput deeply hollowed out right up to the posterior ocelli; hind coxa brown; incomplete sulci of the tergite 2 directed towards the posterior corners of the tergite; 1 yellow but becoming infusate on its apical, turned over part; lateral keel of the propodeum joining the inner part of the posterior keel almost in an even curve (Text-fig. 224); hypopygium short **tormina** sp. n.

BELGIAN CONGO: Mulungu, viii.1946, 10 ♀♀, one the TYPE, 4 ♂♂, (P. C. Lefevre).

Type in the British Museum (Nat. Hist.).

Host: *Eurytela dryope* Cramer (Nymphalidae) on *Ricinus*.

- Vertex and temples without this distinct and characteristic punctation; mesoscutum less extensively punctate and at least on nearly posterior half becoming almost impunctate 12

- 12 Hypopygium long, acute, strongly developed (Text-fig. 220); gaster strongly laterally compressed; frequently tergite 2 with an elongate, median area that is bounded by, or even covered with, fine aciculation; preapical segment of the antenna two and a half to three times as long as wide.

Pale brownish species with tergite 1 more or less yellow and tergite 2 almost as long as 3; hind tarsus longer in proportion to its tibia than in the related *cerales* and the flange beneath segments 1-4 quite inconspicuous; vannal lobe unusually short and with indication of hair-fringe throughout **gratiosus** Wilkinson³²

UGANDA. BELGIAN CONGO. Type in the British Museum (Nat. Hist.).

Host: *Lasiocampid* sp., *Arctiid* sp. Gregarious with the brown cocoons standing on end amongst the hairs of the host.

Distinct on account of the compressed gaster and strongly developed hypopygium.

Hypopygium short, of normal form; gaster shorter and not thus strongly compressed laterally; tergite 2 apparently never with such a raised area bounded by aciculation; preapical segment of the antenna about twice as long as wide.

Species richly marked with yellow on gaster, tergite 2 being often entirely yellow except for an oblique brownish mark on each side; mesoscutum on posterior half with sparser punctation than in *gratiosus*, becoming highly polished and almost bare here **pallidocinctus** Gahan³³

KENYA. UGANDA. Type in the U.S. National Museum.

Host: *Papilio demodocus* Esper. Gregarious. Cocoons brownish, papery, loosely attached to the host.

THE DEMETER-GROUP

Monobasic.

Apanteles demeter Wilkinson

Apanteles demeter Wilkinson, 1934a: 154.

♀. Dark brown, the legs hardly paler. Wings distinctly darkened.

Eyes small. Ocelli in a high triangle, the posterior, transverse tangent passing far in front of the posterior pair. Dorsal surface of mesoscutum and the scutellum polished, impunctate, a

³²*Apanteles gratiosus* Wilkinson, 1930a: 150.

³³*Apanteles pallidocinctus* Gahan, 1918: 588.

little flattened. First abscissa of the radius distinctly shorter than the 1st transverse cubitus. All the femora thickened; tarsi short, the 4th segment of the hind tarsus only slightly longer than wide; inner spur of the hind tibia reaching very slightly beyond the middle of the hind basitarsus. Tergite 1 strongly narrowed behind and narrowly rugulose along sides.

NEW ZEALAND : Bainesse.

Type in the British Museum (Nat. Hist.).

Host : *Tortrix* sp. (Tortricidae).

Wilkinson (1934 : 155) put *demeter* together with several species which show some dorso-ventral compression of the thorax in a group which he designated with the letter "G". Some degree of flattening has occurred independently in several groups of *Apanteles* and by itself cannot be taken as an indication of close relationship. The Indo-oriental *flavipes* Cameron, the African *sesamiae* Cameron, and the European *ferrugineus* Marshall, all of which Wilkinson put with *demeter* in group G, are, in my opinion, more properly allocated to the *glomeratus*-group though occupying a marginal position within it. The Indo-malayan *angustibasis* Gahan, also included by Wilkinson, is, I think, best regarded as an aberrant member of the *ater*-group.

THE *HENICOPUS*-GROUP

Ocelli almost in an equilateral triangle, the posterior, transverse tangent to the anterior ocellus passing far in front of the posterior pair. Propodeum with a medial keel. Hind coxa very large; inner spur of the hind tibia much longer than the outer one and fully two thirds as long as the hind basitarsus. Stigma emitting radius very considerably distal to middle (Text-fig. 114); 1st transverse cubitus as long as, or slightly longer than, the 1st abscissa of the radius. Ovipositor very short, almost hidden. Tergite (2 + 3) with or without a poorly defined, elongate, medial field.

This group may eventually require generic status; it is essentially characterized by the closeness of the brachial vein to the edge of the wing in combination with the linear plate of the first tergite. This last feature is peculiar to the *henicopus*-group and the related *daira*-group; there is not even an approach to it in any of the other groups into which I have divided *Apanteles*. On the other hand, a similar modification of the first tergite occurs frequently among species of *Protomicroplitis*.

It is possible that the affinities of the *henicopus*-group lie with some of the heterogeneous elements of *Protomicroplitis* rather than with *Apanteles*, where it is somewhat unnaturally placed.

I have seen only three specimens, representing three species. These are not very closely related.

AFRICA. PHILIPPINES.

KEY TO SPECIES

FEMALES

- 1 Entirely fulvous, except that the hind femur and hind tibia are slightly darkened at extreme apex; propodeum, in addition to the medial keel, with an oblique keel extending from close to the spiracle to the posterior orifice; posterior, polished band of the scutellum interrupted medially by a patch of rugosity.

Face coarsely reticulate-rugose ; vertex and temples strongly punctate ; posterior ocellus separated from the eye-margin by a distance that is distinctly less than twice the longer diameter of the ocellus ; sculpture of mesoscutum very coarse, consisting of deep rugose-punctuation that, along the course of the notaulices, becomes rugose-reticulation ; the keels bordering the antennal sockets in front are almost united at the middle line of the face (fore wing Text-fig. 114) ; tergite (2 + 3) with narrow, weakly triangular, weakly defined, median field ***iphitus* sp. n.**

PHILIPPINES: Mindanao, Davao, 1 ♀, the TYPE, (Baker). Type in the U.S. National Museum.

- At least the propodeum and the sides of the thorax entirely blackish or black ; propodeum either without or with a less clear indication of a lateral, oblique keel ; posterior, polished band of the scutellum not or hardly interrupted at middle 2
- 2 Head yellow-testaceous ; mesoscutum and scutellum dull reddish ; frons, vertex and temples almost smooth ; disc of scutellum shiny, its rugose-punctuation shallow, superficial ; tergite (2 + 3) highly polished and without a median field.

Mesoscutum less dull and less densely sculptured than in *henicopus* ; hind coxa becoming darkened at apical half above ***thyone* sp. n.**

PHILIPPINES: Luzon, Mt. Makiling, 1 ♀, the TYPE, (Baker). Type in the U.S. National Museum.

The oblique keels of the propodeum are less well defined in this species than in *henicopus* ; the posterior, polished band of the scutellum shows no trace of sculpture medially.

- Head entirely black ; mesoscutum and scutellum black ; frons, vertex and temples dull, coarsely rugose-punctate ; disc of scutellum dull, densely rugose ; tergite (2 + 3) with elongate, median field (Text-fig. 110).

The hind coxa is sharply bicoloured but the yellow part occupies slightly more than basal half ; hind femur yellow on about basal third ; tergite 1, as in the other two species, is yellow throughout ; face deeply, confluent punctate ; in *thyone*, the face is shiny and shows only superficial sculpture ; the oblique keels of the propodeum are better defined than in *thyone* but are not so distinct as in *iphitus*

***henicopus* de Saeger³⁴**

AFRICA: Belgian Congo, Nyasheke (type locality). Kenya, Embu, 1 ♀, in British Museum (Nat. Hist.). Type in the Congo Museum, Tervuren.

The posterior, polished band of the scutellum shows faint traces of sculpture medially.

THE *DAIRA*-GROUP

Monobasic.

***Apanteles दौरa* sp. n.**

♂. Except that the hind tarsus is infuscate, the legs are fulvous throughout.

The surface of the strongly transverse face is very shiny and shows large, scattered pits, with some vague striation towards the eye-margin. Ocelli in a fairly high triangle, the transverse, posterior tangent to the anterior ocellus not quite touching the posterior pair ; the triangle is less high than in the *henicopus*-group. Antennal sockets very deep, their anterior margins strongly raised, sharp, and uniting medially to form a sharp keel ; flagellum with coarse, bristly pubescence, more especially on upper surface. Head above strongly shining, with a few scattered punctures.

Mesoscutum very shiny, with scattered pits ; the notaulic courses are indicated by a row of still larger, more irregularly shaped pits. Propodeum with strong medial keel and various,

³⁴*Apanteles henicopus* de Saeger, 1944 : 152.

strong, secondary keels (Text-fig. 343). Distal end of metacarp not sharply defined ; metacarp about one and a half times longer than its distance from the apex of the radial cell.

Tergite 1 linear but dilated posteriorly ; very deeply grooved throughout. Tergite (2 + 3) smooth, shining ; a faintly indicated suture separates the two parts of the tergite ; tergite 2 shows a hardly defined, raised median swelling that is elongate and more or less parallel-sided.

NEW BRITAIN : Keravat, 10.v.1952, 1♂, the *TYPE*, labelled as bred from Hibiscus Leaf Folder, (*J. H. Barrett*).

Type in the British Museum (Nat. Hist.).

This is a remarkable looking species, quite unlike any other known to me. It is characterized by its very large size, colour and lobed claws. It is more closely related to the *henicopus*-group, I think, than to any other group in *Apanteles*. Its inclusion in *Apanteles* should be regarded as provisional.

THE *VALIDUS*-GROUP

Monobasic.

Apanteles validus Thomson

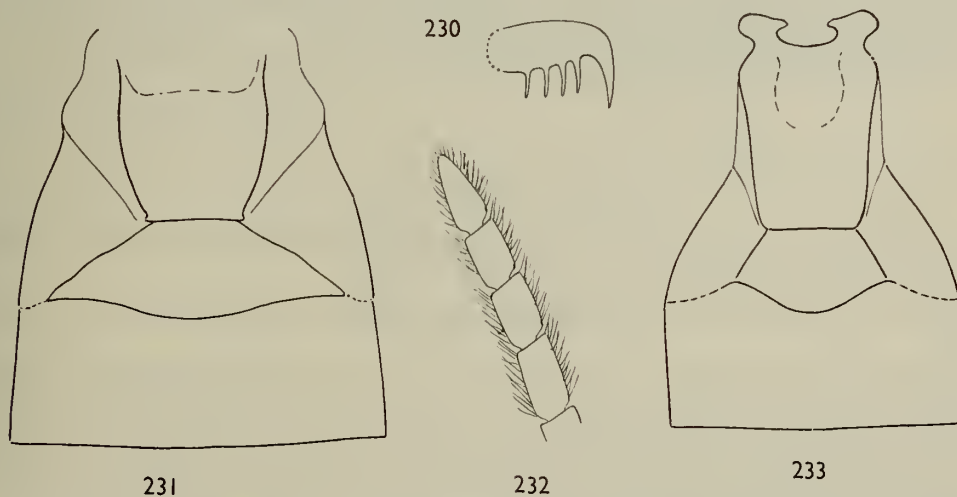
Apanteles validus Thomson, 1895 : 2254.

This species seems to be quite isolated and is largely characterized by its pectinate claws (Text-fig. 280).

♂♀. Wings distinctly darkened. Hind coxa and hind femur black ; males have the hind tibia as dark as the femur and pale only on about basal fifth ; in the two females examined, the hind tibia is paler than its femur. The anterior, hollowed out part of tergite 1 tends to be paler (almost reddish) than the rest of the segment. Flagellum (Text-fig. 232).

The suture between the mesoscutum and the disc of the scutellum is reduced to a fine, simple groove. Although no 2nd transverse cubitus is present, the areolet is somewhat sharply contracted after the manner of some of the *Microgaster* group of genera. Tergite 1 and (2 + 3), (Text-fig. 231).

Length: 4 mm. without ovipositor of female.



FIGS. 230-233. *Apanteles*, ♀: 230, *validus* Thomson, front claw; 231, same, basal tergites; 232, same, apical four flagellar segments; 233, *falcatus* (Nees), basal tergites.

EUROPE. The following material in the British Museum (Nat. Hist.):—Sweden, Skåne, 4 ♂♂, 2 ♀♀. England, Bucks., Whaddon Chase, vi. 1 ♂; Hants, New Forest, vii. 1 ♂.

Type in the University Museum, Lund.

This species falls into *Apanteles* on account of the open areolet but its placement in this genus must be considered unnatural.

MIROPOTES gen. n.

Type-species : *Miopotes creon* sp.n.

Antenna 18-segmented. Ocelli in a high triangle ; posterior, transverse tangent to the anterior ocellus passing far in front of the posterior pair. Head (Text-fig. 236).

Inner spur of the hind tibia slightly shorter than the outer one, not more than about one quarter the length of the hind basitarsus. Side of pronotum without a dorsal furrow, there being only a single furrow dividing it sharply into two parts. Metacarp about one and one third times longer than its distance from the apex of the radial cell ; radiellian cell of the hind wing abruptly and very strongly constricted at the junction with the spurious radial cross-vein and thence continuing as a very narrow cell to the apex of the wing (Text-fig. 281) ; transverse cubitellian vein wanting ; edge of vannal lobe fringed throughout.

Tergite 1 fully twice as long as wide.

The genus is extremely aberrant within the Microgasterini in regard to the venation of the hind wing but in all other respects seems to be more closely related to this tribe than to any other within the Braconidae. I am unable to suggest an affinity with any particular genus within the Microgasterini.

KEY TO SPECIES

FEMALES

- A Propodeum with a large, somewhat poorly defined areola ; inner spur of the hind tibia about one fifth as long as the hind basitarsus ***creon*** sp. n. (p. 200)
- B Propodeum without an areola, the surface almost smooth ; inner spur of the hind tibia a little more than one quarter as long as the hind basitarsus
petiolaris (Szepligeti) (p. 201)

***Miopotes creon* sp. n.**

♀. Hind femur yellowish in the type but deeply infusate in the second female. Wings faintly yellowish in the type but darker in the second female.

Clypeus with a well marked longitudinal keel. Antenna a little shorter than the body ; segments 15–17 about one and a third times longer than wide. Head from in front (Text-fig. 236).

Mesoscutum very shiny, punctate ; the punctures large, more or less contiguous but ill defined and often shallow. Hind wing (Text-fig. 281).

Tergite 1 almost parallel-sided, about twice as long as wide, finely, irregularly striated. Median field of tergite 2 shiny, finely striate. Some trace of striation on tergite 3. Ovipositor very thick, abruptly narrowed and hooked at extreme apex (Text-fig. 251). Hypopygium much lengthened, narrowed apically to about 30 degrees.

Length: ca. 2 mm. without ovipositor.

TASMANIA : Hobart, 3.iii.1935, 1 ♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

A specimen from AUSTRALIA : Canberra, Foot of Black Mt., viii. 1959, 1 ♀, (*V. F. Eastop*), may possibly represent a further species. The wings are smaller, narrower and darker ; the head is more strongly narrowed behind and the ocelli form a slightly higher triangle than in the type female.

***Miopotes petiolaris* (Szepligeti) comb. n.**

Microgaster petiolaris Szepligeti, 1905 : 48.

Microgaster petiolaris Szepligeti ; Wilkinson, 1929 : 104.

I have seen the type specimens of this species—a male and a female, both mounted separately and both labelled “ typus ”.

♀. May be compared with *creon* as follows:—

Mandibles, labrum, all the femora reddish-yellow ; hind tibia reddish yellow but with a very faint apical infuscation.

Eyes slightly less convergent below, the face flat. Antenna broken but the existing basal segments suggest a much longer antenna ; segment 10 is four times as long as wide ; in *creon* segment 10 is about three times as long as wide.

Mesoscutum less shiny, more finely more closely and more superficially punctate. The spurious radius is markedly downcurved throughout its entire length so that the radial cell is slightly narrower and has a more parallel-sided appearance than in *creon*. Propodeum very weakly sloping, flattened and polished and with the merest trace of an areola indicated near the orifice.

Tergite 1 deceptive in appearance ; the sclerotised median plate has a pale, strongly raised lateral margin ; the middle part of the plate, from base to apex, is more heavily sclerotised, blackened and shows as an elongate segment that widens slightly from base to apex, is nearly three times as long as wide and is finely aciculate throughout ; at first sight this darkened part of the tergite might easily be taken to represent the whole of the normal plate. Median field of tergite 2 with a faint, satin-like sheen and with traces of extremely delicate longitudinal aciculation. Apex of gaster damaged so that neither the shape of the hypopygium nor the shape and length of the ovipositor sheath can be made out. A piece of the ovipositor remains ; this is about two thirds as long as the hind basitarsus, straight and without the apical modification that characterizes *creon*.

Length: ca. 4 mm.

♂. Also damaged, the gaster missing. Like the female except that the eyes are normal and only very slightly convergent below.

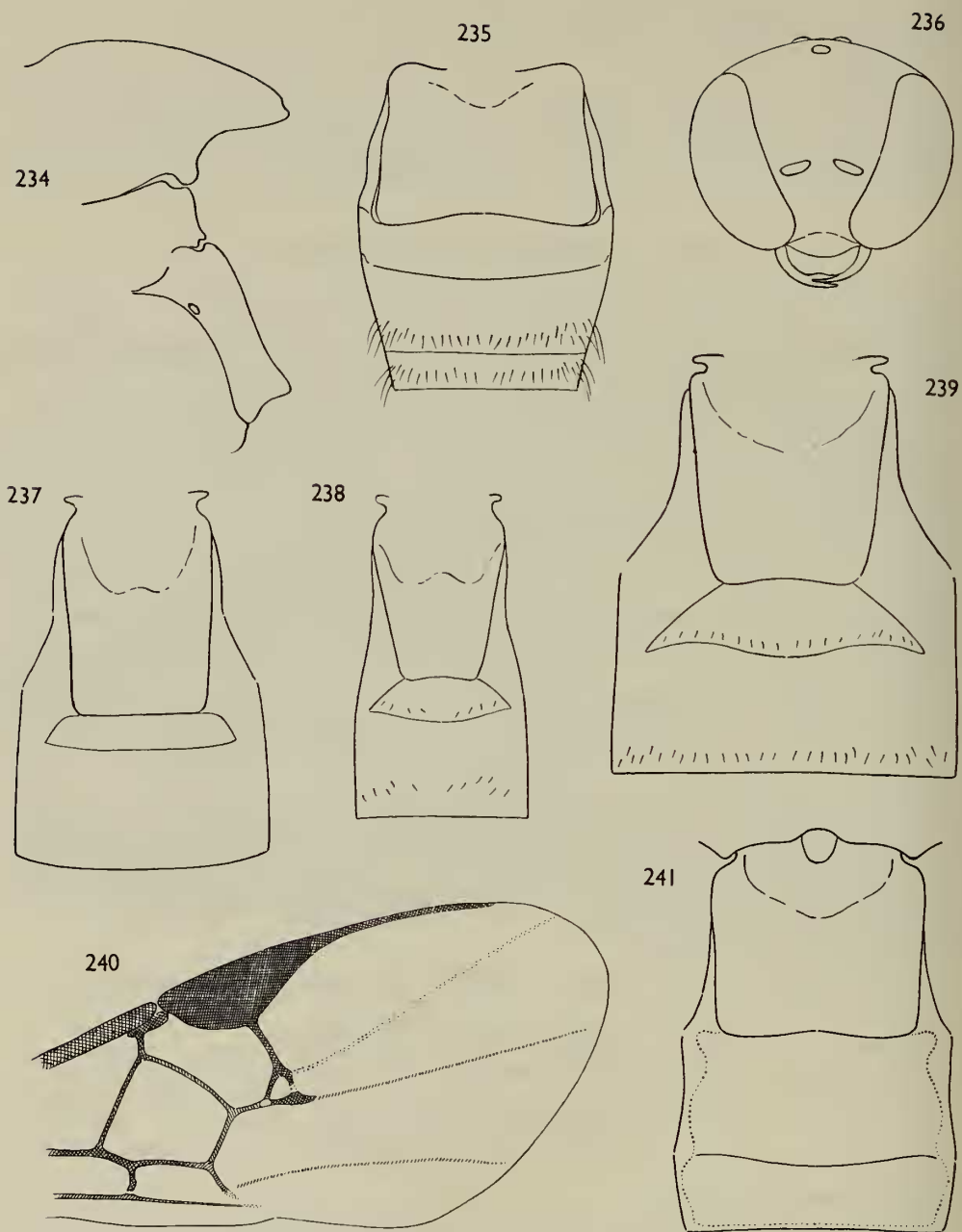
AUSTRALIA : N.S. Wales, Sydney, 1 ♂, 1 ♀, 1900, (*Biró*).

Type in the National Hungarian Museum.

***DASYLAGON* Muesebeck**

Dasyllagon Muesebeck, 1958 : 424.

Head in facial view not in the least lengthened. Mouth parts normal. Scape short (Text-fig. 253). Side of pronotum with deep dorsal furrow as well as the normal medial furrow. Mesoscutum thickly hairy and with sharp, discrete punctation on a strongly shining surface ; no crowding of punctures along the imaginary course of the notaulices. Lateral, polished zone of scutellum pushed as far forwards as possible and cutting off between itself and the disc of the scutellum a long, more or less parallel-sided, foveate furrow. Areolet of the fore wing very



FIGS. 234-241. 234, *Philoplitis coniferens* sp. n., ♀, scutellum, lateral; 235, *Dasylagon aegeriae* Muesebeck, ♀, basal tergites; 236, *Miropotes creon* sp. n., ♀, head, from in front; 237, *Promicrogaster stereo* sp. n., ♀, basal tergites; 238, *Promicrogaster munda* Muesebeck, ♀, same; 239, *Promicrogaster polyporicola* Muesebeck, same, paratype; 240, *Alloplitis guapo* sp. n., ♀, fore wing, part; 241, same, basal tergites.

small ; 1st abscissa of the radius very long. Ovipositor much longer than the hind tibia. Hypopygium membranous at sides and here with numerous longitudinal creases.

Type-species : *Dasyllagon aegeriae* Muesebeck (by original designation).

Seen within the context of the limited amount of New World material that I have had at my disposal, this genus seems to be isolated on the structure of the basal tergites. In wing venation it shows much affinity with *Promicrogaster* but this genus differs from *Dasyllagon* not only on the structure of the gaster but also in having the antennal scape longer, the head and mouth parts lengthened and the glossa deeply forked.

Muesebeck described two species in *Dasyllagon*—*aegeriae* and *simulans*. He has been kind enough to lend me a male and female paratype of *aegeriae*. I have also a second species that I provisionally identify as a colour variant of *simulans*.

KEY TO SPECIES

FEMALES AND MALES

- A ♀. Entire body black ; anterior to the areola a short keel that separates the two large horizontal areas ; 1st abscissa of the discoideus not longer than the nervulus ; areolet larger ; radius less downcurved at apex ; disc of scutellum with weaker punctation ; spines along upper part of hind tibia denser (in fact, very dense), more numerous and less upstanding ; hind coxa black ; tergite 2 considerably more transverse (Text-fig. 235). Gaster of ♂ entirely black . . . *aegeriae* Muesebeck³⁵

COLOMBIA. Bred from unidentified Aegeriid.

Type in U.S. National Museum.

- B ♀. Gaster bright red ; anterior to the areola a poorly defined, excavate area separated from the areola by a transverse keel (the areola thus virtually occupying full length of the propodeum) ; 1st abscissa of the discoideus distinctly longer than the nervulus ; areolet smaller ; radius strongly downcurved at apex ; disc of scutellum with stronger punctation ; spines along upper part of hind tibia less numerous, more upstanding ; hind coxa red ; tergite 2 less transverse. Gaster of ♂ blackened on nearly apical half . . . *simulans* Muesebeck,³⁶ colour var?

HONDURAS. Type in U.S. National Museum.

BRAZIL: Bahia, 1926, 1 ♂, 1 ♀, bred from *Siculodes falcata* Felder (Thyrididae).

In British Museum (Nat. Hist.).

According to Muesebeck, *simulans* has the body entirely black with the legs reddish yellow except that the coxae and trochanters and the hind tarsi are black. In *aegeriae*, the hind femur and hind tibia are red with the hind tarsus contrastingly blackened.

SENDAPHNE gen. n.

Type-species : *Sendaphne olearus* sp.n.

Species of very slender build. Scape rather long (Text-fig. 245). Pronotum with well defined dorsal furrow. Mesoscutum and disc of scutellum highly polished and with at most a very superficial punctation. Lateral polished zone of scutellum triangularly extended forwards

³⁵*Dasyllagon aegeriae* Muesebeck, 1958 : 424.

³⁶*Dasyllagon simulans* Muesebeck, 1958 : 425

and cutting off between itself and the disc a narrow, parallel-sided furrow. Seen from above, the metapleurum bulges markedly. Hind coxa very large; inner spur of the hind tibia fully half as long as the hind basitarsus. Vannal lobe small and beyond its widest part not concave but without a fringe of hairs; areolet very small; 1st abscissa of the discoideus as long as the 2nd; nervellus of the hind wing straight and directed inwards on the vannal lobe side. Tergite 1 very strongly narrowed behind, wedge-shaped (Text-fig. 244). Tergite 2 with two lateral sulci that run close to the lateral margin of the segment and enclose a subtriangular area that is considerably longer than wide at apex.

Related to *Promicrogaster* Brues and Richardson (known to me only from *P. munda* Muesebeck and *P. polyporicola* Muesebeck) but differing from this genus in having the propodeum smooth, polished and the median field of tergite 2 quite different in shape.

It is difficult to estimate the generic value of *Promicrogaster* and *Sendaphne* on the species available for examination and it may become necessary later to reduce them both to the status of species-groups within *Hypomicrogaster*.

The labium of *Sendaphne* is more lengthened and the galea considerably longer than in any species of *Promicrogaster* known to me.

KEY TO SPECIES

FEMALES

- A Head bright reddish-yellow like the thorax; tergites 4-6 banded with dark brown; median field of tergite 2 wider, embracing nearly the entire surface of the segment; gaster less compressed laterally; larger, ca. 5 mm. without ovipositor; ocelli in a lower triangle ***olearus* sp. n.**
 BRAZIL: Nova Teutonia, 2.iii.1937, 1 ♀, the TYPE, (Plaumann). Type in the British Museum (Nat. Hist.).
- B Head blackish; tergites 4-6 reddish-yellow like the rest of the gaster; median field of tergite 2 narrower, occupying a smaller area of the entire surface of the tergite (Text-fig. 244); gaster very strongly compressed laterally; smaller, ca. 4 mm. without ovipositor; ocelli in a higher triangle ***sulmo* sp. n.**
 MEXICO: Teapa, Tabasco, 1, 1 ♀, the TYPE, (Godman-Salvin Coll.). Type in the British Museum (Nat. Hist.).

LARISSIMUS gen. n.

Type-species: *Larissimus cassander* sp.n.

♂♀. Size large: 8 mm. Entire body highly polished. Labial palpus 3-segmented. Scape rather short. Ocelli in a low triangle, the posterior, transverse tangent to the anterior ocellus cutting the other pair. Side of pronotum without trace of a dorsal furrow. Lateral, polished zone of the scutellum only very weakly convex in the forwards direction. Propodeum with strong medial keel. First abscissa of the radius very long, twice as long as the 1st transverse cubitus and very obliquely placed on the stigma; areolet fairly large, the 2nd transverse cubitus received onto the extreme base of the 2nd abscissa of the radius (Text-fig. 340). Claws simple. Tergite 1 about two and a half times longer than wide (in apical third). Hypopygium evenly sclerotized but sharply folded towards apex. Ovipositor very short, its sheaths about as long as the 2nd segment of the hind tarsus.

In general structure of body, the genus reminds of *Protomicroplitis* and *Parenion*.

But *Protomicroplitis* has, in the main, the thorax heavily punctate or otherwise sculptured whereas *Larissimus* is characterized by its highly polished appearance.

From *Parenion* it differs in details of wing venation. From both these genera and indeed from all other Microgasterini it differs in having an undefined vannal lobe.

Larissimus cassander sp. n.

♂♀. Thorax and gaster red ; the gaster darkened apically in the female from Passe des Indies. Head mostly black above with a reddish patch extending forwards from the posterior ocellus to the inner orbit of the eye ; lower part of the head and most of the lower part of the face red. Front and middle legs reddish-yellow ; hind legs red with the hind tibia slightly darker and the hind tarsus strongly blackened. Wings smoky with yellowish tint ; still darker within the 1st discoidal cell and the radial cell ; to the naked eye, the fore wing appears to be crossed by an orange-yellow band that embraces the stigma.

♀. Head above, including the eyes, rather conspicuously hairy. Antenna broken but the existing 10 flagellar segments clothed with extremely short pubescence. Inner spur of the hind tibia almost two thirds as long as the hind basitarsus. Tergite 1 swollen and convex in apical half ; deeply channelled in anterior half. Tergite 2 with large, triangular median area whose base is slightly longer than its sides (Text-fig. 248). Ovipositor thick, sickle-shaped (Text-fig. 252).

♂. Like the female.

BRAZIL : Nova Teutonia, 7.ii.1938, 1 ♀, the *TYPE*, 26.ii.1937, 1 ♂, 5.xii.1937, 1 ♂, Passe des Indies, i.1937, 1 ♀, (All *Fritz Plaumann*).

Type in the British Museum (Nat. Hist.).

This is the most brilliantly coloured and largest Microgasterine known to me. At first sight it could easily be mistaken for a member of the cyclostome subfamily Braconinae.

PRASMODON gen. n.

Type-species : *Prasmodon eminens* sp.n.

Shape of antenna short. Ocelli in a high, almost equilateral triangle. Side of pronotum without trace of a dorsal furrow. Lateral, polished zone of scutellum reduced to a linear band that is not at all convex in the forwards direction. Propodeum with a very strong, medial, longitudinal keel and a transverse keel, that together divide the propodeum into four large areas. Areolet of the fore wing fairly large, having the appearance of being closed externally by the 2nd transverse cubitus alone ; but, judging from the position of the point of emission of the spurious part of the radius, the areolet is, in fact, closed by the short 1st abscissa of the radius, plus the 2nd transverse cubitus ; the 2nd transverse cubitus is reduced to a hyaline point (Text-fig. 242) ; metacarp much longer than its distance from the apex of the radial cell ; radius markedly downcurved at apex ; vannal lobe of hind wing narrow, much attenuated apically, the narrowed apical part darkened (sclerotised ?) and covered thickly with adpressed setae ; the spurious vein closing the 2nd cubitellian cell of the hind wing hardly indicated. Inner spur of the hind tibia reaching to about middle of hind basitarsus ; hind coxa moderately large, smooth.

This genus is highly aberrant though I have no doubts that it is correctly placed in the Microgasterini. It probably represents a line of development that must have

diverged early in the evolution of the tribe. I am at a loss to suggest a relationship with any particular genus, though I think it should be mentioned that the deep notaulices and very short first abscissa of the discoideus point to an affinity with the *Microplitis* group of genera. These resemblances, however, may indicate only a deceptive convergence.

***Prasmodon eminens* sp. n.**

♂. Entirely fulvous-red. Legs yellowish red with the hind tibia at apex and the hind tarsus throughout, blackened. Wings smoky. Antenna broken but segment 16 yellow and indicating that the brown flagellum has a contrasting yellow apex.

Head deep from back to front, smooth, virtually impunctate; its sides behind the eyes almost straight (Text-fig. 246). Pubescence of flagellum extremely short, not upstanding.

Keels of the propodeum strongly raised; the areas enclosed by them smooth. Claws with a few fine, colourless pectinations at base.

Tergite 1 about two and one third times longer than its greatest width (at base). The membranous anterior corner of tergite (2 + 3) is separated from the rest of the tergite by a smooth, raised ridge; tergite (2 + 3) smooth, shining, and without a delimited basal field.

Length: 5 mm.

PERU: Chanchamayo, 18.viii.1949, 1 ♂, the TYPE, (*J. S. Schunke*).

Type in the British Museum (Nat. Hist.).

***SEMIONIS* gen. n.**

Type-species: *Semionis rarus* sp.n.

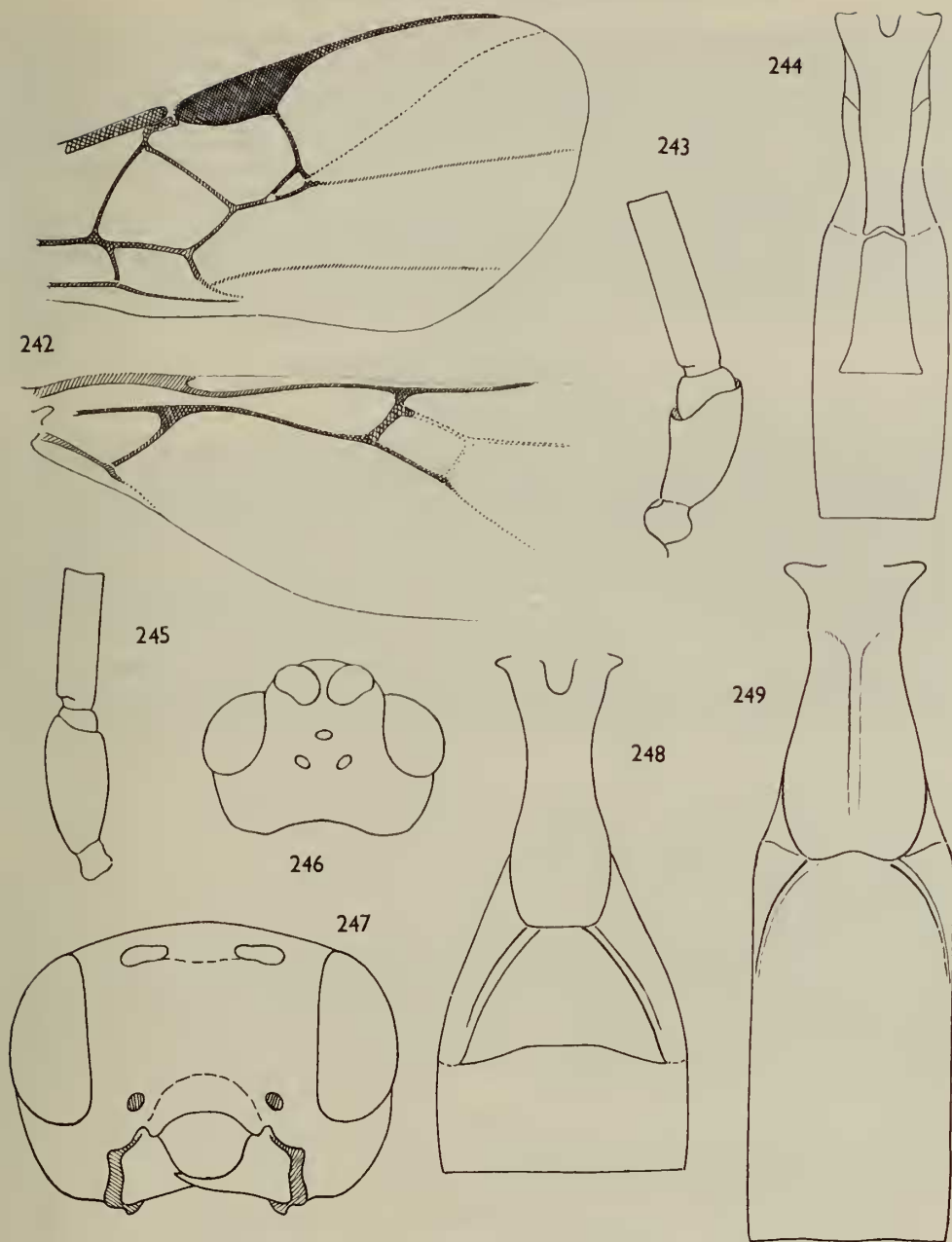
Head large, deep from back to front. Mandibles unusually wide at base (Text-fig. 247). Palpi very short, the labial palpus 3-segmented. Antenna with 18 segments; scape short. Ocelli in a high, almost equilateral triangle.

Side of pronotum without a dorsal furrow. Lateral, polished zone of the scutellum only feebly convex in the forwards direction; hence cutting off between itself and the disc of the scutellum a tongue-shaped rugose area that is nowhere parallel-sided. Propodeum having a flattened, polished appearance, completely without areolation and medially completely smooth. Transverse cubitellian vein of the hind wing wanting; 1st abscissa of the discoideus of the fore wing about half as long as the 2nd. Claws simple.

In lacking the spurious transverse cubitellian vein of the hind wing, this species is almost transitional between the Microgasterini and the Cardiochilini, though on a majority of characters it has much more in common with the former tribe than with the Cardiochilini. In the Cardiochilini, the labial palpus is 4-segmented; the antenna is multiarticulate, deep notaulices are present and the shape of the 1st tergite is essentially different from what occurs in *Semionis*. The shape of the 1st cubital cell is quite different in the Cardiochilini.

***Semionis rarus* sp. n.**

♂. Blackish; face slightly paler along the inner orbits; tergite 1 and rather more than the basal half of tergite (2 + 3) yellowish, with tergite 1 showing darker suffusion where it turns over. Hind coxa brown but paler apically; hind femur and hind tibia yellow; hind tarsus weakly infusate. Wings slightly embrowned; the venation evenly dark brown. Mandibles and labrum yellow.



FIGS. 242-249. 242, *Prasmodon eminens* sp. n., ♂, fore wing; 243, *Parenion kokodana* (Wilkinson), ♀, first three antennal segments; 244, *Sendaphne sulmo* sp. n., ♀, basal tergites; 245, *Sendaphne olearus* sp. n., ♀, first three antennal segments; 246, *Prasmodon eminens* sp. n., ♂, head, from above; 247, *Semionis rarus* sp. n., ♂, head, from beneath; 248, *Larissimus cassander* sp. n., ♀, basal tergites; 249, *Parenion kokodana* (Wilkinson), ♀, basal tergites.

Head smooth, shining. Mesoscutum smooth, shining, its pubescence rather conspicuous. Suture between the disc of the scutellum and the mesoscutum very shallow, inconspicuous. Propodeum with a certain amount of rugosity towards sides and more especially around the spiracle. Mesopleurum with a deep, smooth sternalus, which is about as long as the middle basitarsus.

Tergite 1 strongly narrowed from base to apex, highly polished, its large basal part highly shining and bare. Median field of tergite (2 + 3), having the form of an equilateral triangle but its posterior corners indistinct.

Length: 3 mm.

S. AFRICA : Cape Province, Mossel Bay, viii.1921, 1 ♂, the *TYPE*, (R. E. Turner). Type in the British Museum (Nat. Hist.).

***PARENION* gen. n.**

Type-species : *Microgaster kokodana* Wilkinson.

Scape long (Text-fig. 243). Side of pronotum without trace of a dorsal furrow. Disc of scutellum polished, strongly convex. Propodeum somewhat depressed along the middle and with medial keel ; each half highly polished and markedly convex. Stigma narrow, emitting radius far distal to middle ; 1st abscissa of the radius as long as the 1st transverse cubitus, the two veins together forming a strongly, almost semicircularly, curved vein ; areolet extremely small (Text-fig. 250). Inner spur of the hind tibia very powerful, about three quarters as long as the hind basitarsus ; hind coxa very large. Ovipositor very short, its sheaths about as long as the 2nd segment of the hind tarsus. Hypopygium evenly sclerotised all over.

The essential characters of the genus lie in the wing-venation, especially that of the hind wing. The general facies, large hind coxae, short ovipositor and evenly sclerotised hypopygium indicate a fairly close relationship with *Protomicroplitis* S.L.

***Parenion kokodana* (Wilkinson) comb. n.**

Microgaster kokodana Wilkinson, 1936 : 87.

♂♀. Reddish fulvous. Wings rather strongly embrowned. Legs reddish fulvous with the hind tarsus darkening distal to middle.

Top of head polished, impunctate. Mesoscutum strongly, rather coarsely punctate. Hind coxa sharply punctate on a very shiny surface. Tergite 1 slightly widened from base to apex, about two and a half times longer than wide, with weak medial furrow, its surface uneven by reason of a few elongate pits and depressions. Tergite (2 + 3) without a delimited medial field at base but with a lateral groove isolating both the anterior corner of the segment and the extreme lateral margin (Text-fig. 249).

Length: ca. 4 mm.

PAPUA.

Type in the British Museum (Nat. Hist.).

As a species, *Parenion kokodana* is remarkably distinct and without close allies.

***HYPOMICROGASTER* Ashmead gen. rev.**

Hypomicrogaster Ashmead, 1898 : 166.

Microgaster Latreille ; Muesebeck, 1922 : 20.

Type species : *Microgaster zonaria* Say. Monobasic.

In 1922, Muesebeck wrote that the type of *zonaria* Say was lost and published *Protopanteles recurvariae* Ashmead as a synonym of it. He has been good enough to send me specimens of *recurvariae* and I have based my conception of *Hypomicrogaster* on this species.

In order to find a means of dividing up the large number of species from all parts of the world falling within the loose definition of *Microgaster* auctt., I have found it convenient to make use of *Hypomicrogaster*. I have accepted the genus in a wide sense, splitting it into various species-groups. The resulting arrangement may be somewhat artificial but I hope it will provide at least a working foundation from which further investigations may be made.

KEY TO SPECIES-GROUPS

FEMALES

- 1 Metacarp very short, hardly longer than its distance from the apex of the radial cell.
Antenna short, thick; mesoscutum highly polished, impunctate; tergite 1 considerably longer than wide, more or less parallel-sided and almost polished; ovipositor sheath hardly more than half as long as the hind tibia. Europe.
wesmaeli-group (p. 210)
- Metacarp much longer than this 2
- 2 Propodeum with a more or less distinct areola and costula, the areola usually poorly defined and traversed by irregular keels and rugae.
Areolet very small, sometimes reduced to a mere slit; 2nd transverse cubitus always arising from the 1st transverse cubitus; inner spur of the hind tibia considerably longer than half the hind basitarsus 3
- Propodeum without either areola or costula 4
- 3 Tergite 1 distinctly narrowed behind, dull, coarsely rugose; areola deep and more or less smoothly excavated. Brazil **virbius-group** (p. 210)
- Tergite 1 not at all narrowed behind, usually slightly widened here; somewhat shiny and, where it turns over, usually with well defined punctation; areola, if defined at all, shallow, very irregular in outline and often divided by a weak, longitudinal keel. American continent **zonaria-group** (p. 212)
- 4 Areolet very small, the 2nd transverse cubitus arising from the 1st at a considerable distance proximal to the junction of the 1st and 2nd abscissa of the radius.
Tergite 1 always very distinctly narrowed behind; propodeum with strong, medial keel. Indo-oriental region **psarae-group** (p. 217)
- Areolet much larger, the 2nd transverse cubitus arising from the 2nd abscissa of the radius or interstitial with this (but see *laurae* de Saeger in *vacillatrix* group) 5
- 5 Hind spurs short, subequal 6
- Hind spurs not subequal, the inner one always considerably longer than the outer one.
Propodeum with a medial keel but never with trace either of costula or areola; tergite 1 always strongly narrowed behind, more or less wedge-shaped. Old World
vacillatrix-group (p. 219)
- 6 Propodeum coarsely rugose and with a strong, medial keel; side of pronotum with foveate, dorsal furrow (Text-fig. 262); radial cell markedly downcurved at apex.
Wings strongly darkened; hind coxa and hind tibia black and in sharp contrast with the bright yellow femur which is merely tipped with black. Australia
epaphus-group (p. 215)
- Propodeum in greater part smooth and without a medial keel; at most some rugosity surrounding the posterior orifice; side of pronotum without trace of a dorsal furrow; radial cell not markedly downcurved at apex.

- Ocelli in a moderately high triangle, the posterior, transverse tangent to the anterior ocellus hardly touching the hind pair 7
- 7 Mesoscutum and upper part of side of pronotum bright reddish-yellow ; rest of thorax black ; disc of scutellum polished, impunctate, bare, slightly projecting behind over the basal part of the postscutellum ; posterior extremities of the lateral, rugose tongues of the scutellum widely separated behind (Text-fig. 257). Tasmania
resplendens-group (p. 216)
- Thorax entirely black ; disc of scutellum with at least an indication of punctures, hairy all over, not projecting over the basal part of the postscutellum ; distance between the posterior extremities of the lateral, rugose tongues of the scutellum much shorter. Australia **morata-group** (p. 217)

THE WESMAELI-GROUP

Monobasic.

Hypomicrogaster wesmaeli (Ruthe) **comb. n.**

Microgaster wesmaeli Ruthe, 1860 : 148.

This is a remarkable little species, without close allies so far as I know and perhaps not very naturally placed in *Hypomicrogaster*.

♀. Ocelli in a high triangle, with the posterior, transverse tangent to the anterior ocellus passing far in front of the posterior pair ; further, the ocelli are small, the posterior ocellus being separated from the eye-margin by about three and a half times its own diameter. Top of head, mesoscutum and disc of scutellum highly polished. Propodeum vaguely rugose and with a more or less clearly defined, short, basal keel. Stigma short, rather broad. Inner spur of the hind tibia slightly more than half as long as the hind basitarsus. Median field of tergite (2 + 3) subrectangular.

EUROPE.

Location of type unknown.

THE VIRBIUS-GROUP

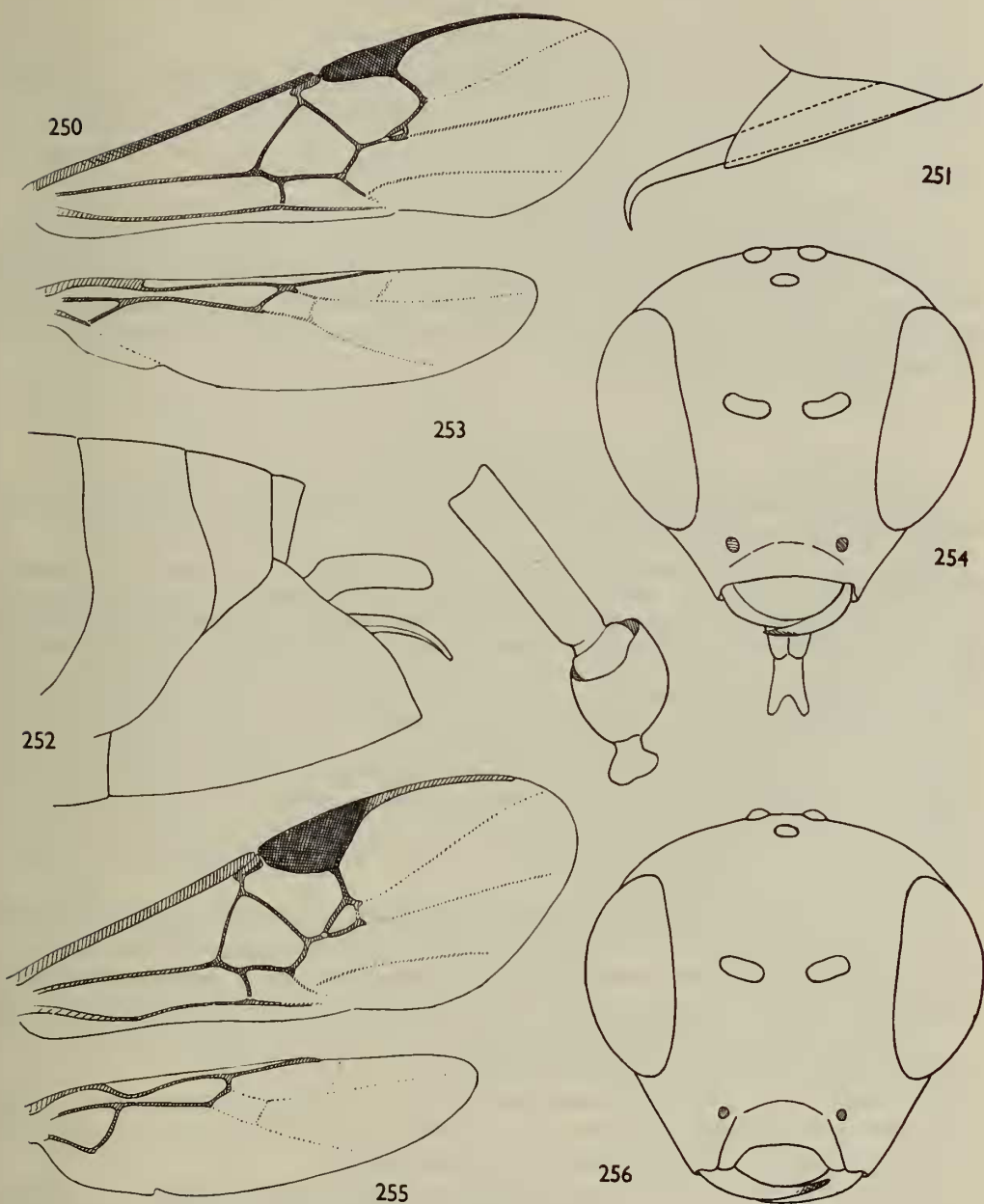
Monobasic.

Hypomicrogaster virbius sp. n.

♀. Black ; tergite (2 + 3) except for the median field, yellow. Scape yellow. Clypeus somewhat yellow medially. Front and middle legs yellow ; hind coxa and hind femur, except at tip of femur, yellow ; hind tibia on apical third and hind tarsus throughout, infusate. Wings faintly tinted with brown ; venation brown throughout ; setae brown.

Face smooth, impunctate but with a pronounced satin-like sheen. Vertex between the ocelli and the eye-margin with only the merest trace of punctation and the satin-like sheen. Antenna about as long as the body with segment 17 one and one third times as long as wide ; flagellum with somewhat upstanding, bristly pubescence.

Mesoscutum dull, with satin-like sheen ; with heavy but very superficial punctation ; the course of the notaulices is very slightly impressed and the punctures here are larger and virtually contiguous. Disc of scutellum smooth with satin-like sheen and with the merest trace of punctation towards sides ; lateral, polished zone of scutellum pushed far forwards and cutting off between itself and the disc a long narrow furrow. Areola of the propodeum large (Text-fig. 259). Areolet minute (Text-fig. 261) ; vannal lobe of the hind wing very slightly concave beyond its widest part and here without trace of a hair-fringe. Inner spur of the hind tibia



FIGS. 250-256. 250, *Parenion kokodana* (Wilkinson), ♀, wings; 251, *Miopotes creon* sp. n., ovipositor; 252, *Larissimus cassander* sp. n., ♀, apex of gaster, lateral; 253, *Dasylagon simulans* Muesebeck, ♀, first three antennal segments; 254, *Promicrogaster spiloapterus* sp. n., ♀, head, from in front; 255, *Hypomicrogaster ceto* sp. n., ♀, wings; 256, *Promicrogaster prater* sp. n., ♀, head, from in front.

white, much longer than the outer one and distinctly reaching beyond the middle of the hind basitarsus ; hind tarsus having a somewhat bristly appearance.

Tergite 1 twice as long as its middle width, hardly narrowed behind, humped longitudinally where it turns over and its posterior, horizontal surface as long as wide, dull, densely, coarsely rugose. Ovipositor sheath about three quarters as long as the hind tibia.

Length: ca. 3.2 mm. without ovipositor.

BRAZIL : Nova Teutonia, viii.1935, 1 ♀, the *TYPE*, (*Plaumann*).

Type in the British Museum (Nat. Hist.).

This insect is hardly more than an isolated species within the *zonaria*-group, differing from it only in the stronger development of the propodeal areolation and the shape and sculpture of tergite 1. Unlike the species of the *zonaria*-group, the occipital region in *virbius* is in no way differentiated from the vertex, the two regions flowing smoothly into each other.

THE ZONARIA-GROUP

This group contains the typical species of *Hypomicrogaster* and seems to be confined to the American continent.

Flagellum with a characteristic bristly appearance. Ocelli in a low triangle, the posterior, transverse tangent to the anterior ocellus cutting the posterior pair. Occipital region gently scooped out, the resultant polished area more or less delimited by being pushed forwards in front right up to, and virtually touching, the posterior ocelli ; and delimited at sides by the distinctly punctate temples. Pronotum with a dorsal furrow. Mesoscutum polished, punctate ; never with satin-like sheen. Propodeum short, its areolation almost always irregular and poorly defined ; if the propodeum shows a distinct postero-lateral field, then this is always distinctly transverse. Inner spur of the hind tibia reaching at least considerably beyond the middle of the hind basitarsus ; inner spur of the middle tibia very strong and distinctly longer than the middle basitarsus. Areolet of the fore wing always very small, the 2nd transverse cubitus received onto the 1st at a considerable distance from the junction of the 1st abscissa of the radius and the 1st transverse cubitus. Ovipositor projecting freely, its sheaths at least half as long as the hind tibia. Tergite 1 never narrowed behind.

Muesebeck (1958 : 412) recognised the homogeneity of this group and suggested that if more information were available it might be advisable to give it generic rank. He gave a key to the five neotropical species known to him, all apparently closely related and difficult to separate. Of these five, only *imitator* Ashmead is known to me. It is possible that some of the species I now introduce as new will later fall as synonyms of those dealt with by Muesebeck.

The scooped-out occipital region is characteristic of all the species I include in the key below (but head lost in type of *imitator* Ashmead). It does not occur in any of the other species-groups I have placed in *Hypomicrogaster*.

All the species keyed below have the face conspicuously but somewhat shallowly rugose-punctate and the mesoscutum highly polished with moderately sharp, well separated punctures. Further, the legs are predominantly bright yellow with the hind femur yellow except for faint apical infuscation.

KEY TO SPECIES

FEMALES

- 1 Whole body virtually entirely reddish-yellow with only the head black and the gaster with some dark markings apically 2
 - At least the propodeum and the 1st tergite blackened 3
 2 Ovipositor sheath fully as long as the hind tibia ; mesoscutum, especially posterior to the tegulae, very narrowly margined with black.

Head blackish with the clypeus yellowish ; fore wing faintly darkened distal to the areolet ; tergites 4-6 with a brown band ; the bands widen medially, leaving on each side of the gaster a transverse yellow mark ; inner spur of the middle tibia very powerful, very distinctly longer than the middle basitarsus ; gaster rather more elongate than in the other species ; tergite 1 highly polished and with a few, large, shallow pits *ecus* sp. n.

BRAZIL: Nova Teutonia, 29.vi.1938, 1 ♀, the TYPE, (Plaumann). Type in the British Museum (Nat. Hist.).

- Ovipositor sheath hardly three quarters as long as the hind tibia ; mesoscutum entirely reddish-yellow.

Head missing, but black according to Ashmead, except face ; wings hyaline ; median cell of fore wing very sparsely hairy (setae rubbed off ?) ; propodeum with well defined areola and equally well defined, postero-lateral areas ; the areola is divided into two parts by a longitudinal keel, a condition more or less typical of the group ; tergite 1 very distinctly widened behind, its horizontal surface with scattered, deep pits ; these are much more obvious than in *ecus* *imitator* (Ashmead)³⁷

- 3 Thorax blackish, at most with a pale spot at each posterior corner of the mesoscutum 4
 - Thorax reddish-yellow or at least testaceous with darker suffusion posteriorly.
 Hind coxa entirely yellow 7

- 4 Median field of tergite (2 + 3) twice as wide as long (Text-fig. 268) ; tergite 1 narrow, fully twice as long as wide, polished and with hardly a trace of punctuation.

Hind coxa entirely yellow ; mesoscutum with pale spot at each posterior corner ; median field of tergite (2 + 3) and most of the segment posterior to the field, bright reddish-yellow ; ovipositor very short, about half as long as the hind tibia

acarnas sp. n.

BRAZIL: Nova Teutonia, 11.v.1938, 1 ♀, the TYPE, (Plaumann). Type in the British Museum (Nat. Hist.).

- Median field of tergite (2 + 3) always more transverse than this, fully three times as wide as long ; tergite 1 shorter, less narrow and with more punctuation or rugose-punctuation on its horizontal part 5
 5 Hind coxa entirely yellow ; inner spur of the middle tibia weaker, not longer than the middle basitarsus.

Tergite 1 quite strongly narrowed behind ; ovipositor sheath about two thirds as long as the hind tibia ; wings clear hyaline ; tergite (2 + 3) yellow or testaceous

zonaria (Say)³⁸

N. AMERICA. Type lost.

Host: *Recurvaria piceaella* Kearfott and *R. thujaella* Kearfott (Gelechiidae), (Muesebeck, 1922).

³⁷ *Urogaster imitator* Ashmead, 1900 : 288.

Apanteles imitator (Ashmead) Muesebeck, 1920 : 504.

Microgaster imitator (Ashmead) Wilkinson, 1930a : 157.

Microgaster imitator (Ashmead) ; Muesebeck, 1958 : 413.

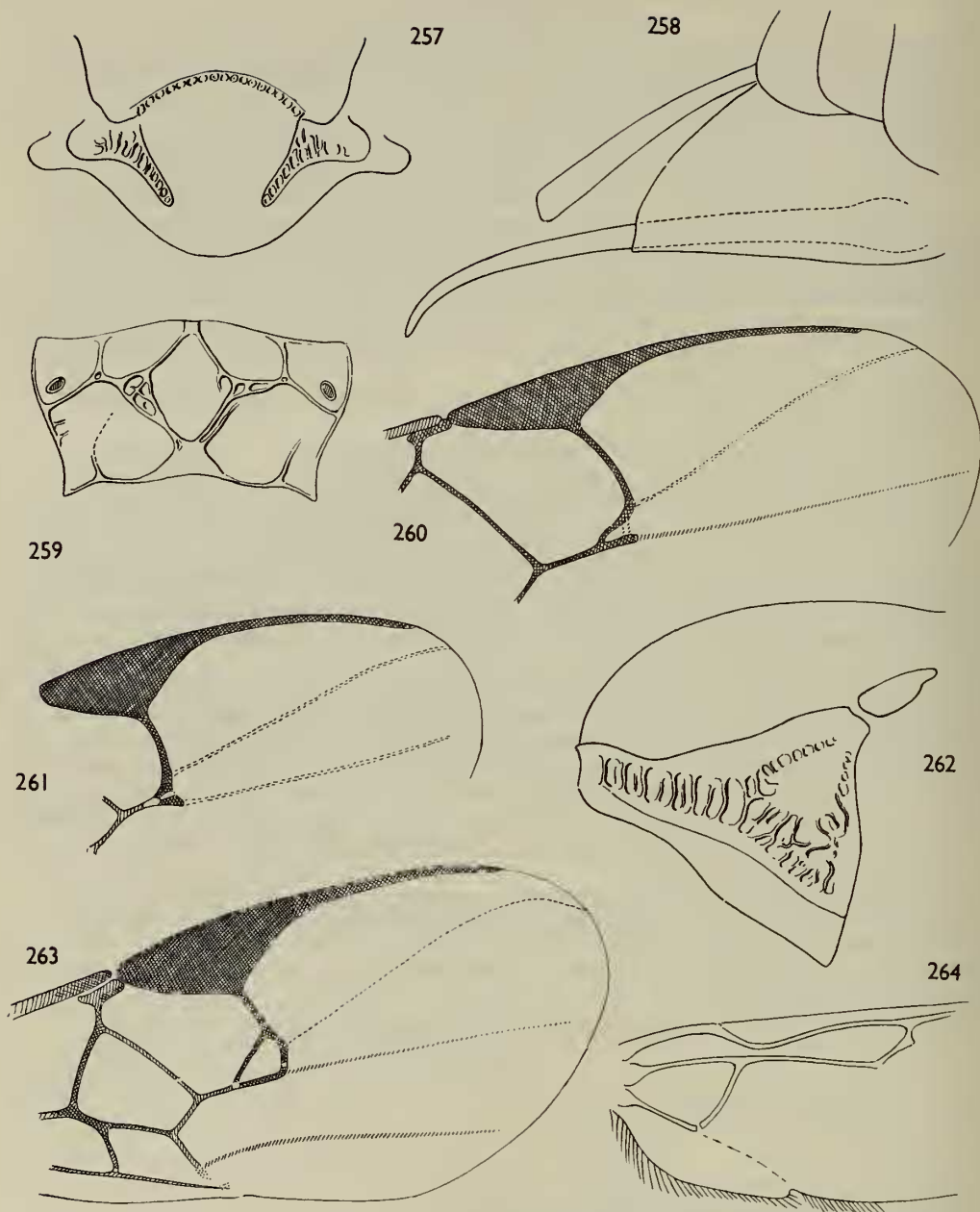
Hypomicrogaster imitator (Ashmead) **comb. n.**

³⁸ *Microgaster zonaria* Say, 1836-7 : 263.

Protapanteles recurvariae Ashmead 1903 : 144 [Syn. Muesebeck, 1922 : 24]

Microgaster recurvariae (Ashmead) Muesebeck, 1920 : 570.

Hypomicrogaster zonaria (Say) **comb. n.**



FIGS. 257-264. *Hypomicrogaster*: 257, *resplendens* (Wilkinson), ♀, scutellum; 258, *morata* (Wilkinson), apex of gaster, lateral; 259, *virbius* sp. n., ♀, propodeum; 260, *papua* (Wilkinson), ♂, fore wing, part; 261, *virbius* sp. n., ♀, fore wing, part; 262, *epaphus* sp. n., ♀, side of pronotum; 263, same, fore wing, part; 264, *ceto* sp. n., ♀, hind wing, part.

- Hind coxa infusate at least on basal third ; inner spur of the middle tibia stronger, distinctly longer than the middle basitarsus 6
- 6 Hind coxa infusate on less than basal half ; ovipositor sheath longer, hardly shorter than the hind tibia ; 1st abscissa of the radius longer ; bristly pubescence of the flagellum very slightly longer *acontes* sp. n.
 BRAZIL: Nova Teutonia, 12.iv.1938, 1 ♀, the TYPE, (Plaumann). Type in the British Museum (Nat. Hist.).
- Hind coxa blackened on about basal half ; ovipositor sheath shorter, about two thirds as long as the hind tibia ; 1st abscissa of the radius shorter ; bristly pubescence of flagellum very slightly shorter *tydeus* sp. n.
 BRAZIL: Nova Teutonia, 12.v.1938, 2 ♀♀, one the TYPE, iv.1938, 3 ♀♀, 5.vii.1937, 1 ♀, 17.xi.1938, 1 ♀, (Plaumann). Type in the British Museum (Nat. Hist.).
 Distinguishable from *zonaria* only on colour of hind coxa and stronger spurs of middle legs.
- 7 Mesoscutum more or less testaceous with a darker flush posteriorly, from which two dark streaks extend forwards along the imaginary course of the notaulices.
 Disc of scutellum darkened like the posterior part of the mesoscutum ; medial field of tergite (2 + 3) brownish ; tergite 1 markedly widened behind (Text-fig. 270) its horizontal part covered with large, well separated, pit-like punctures. Smallest of included spp., ca. 2.5 mm. without ovipositor *metris* sp. n.
 BRAZIL: Nova Teutonia, 3.vii.1937, 2 ♀♀, one the TYPE, 16.ix.1938, 1 ♀, (Plaumann). Type in the British Museum (Nat. Hist.).
- Mesoscutum bright reddish-yellow ; if it shows a darker flush then this is situated anteriorly 8
- 8 Horizontal part of tergite 1 almost smooth, with faint, satin-like sheen and at most with fine, widely scattered punctures on its horizontal part ; ovipositor short, hardly two thirds as long as the hind tibia.
 Variable in colour ; sometimes tergite 1 paler medially, tergite 4 as brightly yellow as tergite (2 + 3) and the more apical tergites yellow laterally ; mesoscutum yellow *moscus* sp. n.
 BRAZIL: Nova Teutonia, 19.v.1938, 1 ♀, the TYPE, 7.iv.1938, 1 ♀, 23.iv.1938, 1 ♀, 18.v.1938, 1 ♀, 3.x.1938, 1 ♀, (Plaumann). Type in the British Museum (Nat. Hist.).
- Horizontal part of tergite 1 with large, well separated punctures over most of its surface ; towards posterior corners, the outline of the punctures is obscured by striate-rugosity ; ovipositor considerably longer, fully as long as the hind tibia.
 The yellow and black areas more sharply contrasted than in *moscus* ; propodeum intensely black ; antenna relatively longer than in *moscus* ; mesosternum reddish-yellow in type, darker in front and with a dark streak along each side ; mesosternum entirely reddish-yellow in 2nd female ; outer, upper face of hind tibia rather coarsely rugose-striate ; in *moscus*, this part is polished with scattered punctures . . . *solox* sp. n.
 BRAZIL: Nova Teutonia, 17.viii.1937, 1 ♀, the TYPE, 4.viii.1938, 1 ♀, (Plaumann). Type in the British Museum (Nat. Hist.).

THE *EPAPHUS*-GROUP

Monobasic.

Hypomicrogaster epaphus sp. n.

♀. Head and thorax entirely black. Gaster bright yellow throughout. Wings deeply embrowned ; to the naked eye, both front and hind wings are markedly paler on about basal third.

Head above smooth, shining and virtually impunctate. Ocelli in a moderately high triangle, the posterior transverse tangent to the anterior ocellus hardly touching the posterior pair.

Antenna about as long as the body, with the preapical segment one and two thirds as long as wide.

Mesoscutum conspicuously but finely punctate on anterior half ; between the mesoscutum and the disc of the scutellum a wide, coarsely, deeply costate furrow. Lateral, polished zone of the scutellum only very weakly convex in the anterior direction (in this respect markedly different from group of *zonaria*). Radius strongly downcurved at apex ; 1st abscissa of the discoideus about two thirds as long as the 2nd (Text-fig. 263) ; vannal lobe with distinct hair-fringe throughout.

Tergite 1 polished throughout. Ovipositor sheath about one and a half times longer than the hind tibia ; ovipositor itself rather thick, evenly and slightly downcurved at apex.

Length: ca. 3.5 mm. without ovipositor.

AUSTRALIA : S.E. Queensland, Tambourine Mts., 1-19.v.1935, 1 ♀, the *TYPE*, (R. E. Turner) ; F. C. T., Blundell's, 23.iii.1930, 1 ♀, (I. M. Mackerras).

Type in the British Museum (Nat. Hist.).

A most distinctive species on colour alone. I have met with no species with which it could be confused.

THE *RESPLENDENS*-GROUP

Monobasic.

Hypomicrogaster resplendens (Wilkinson) **comb. n.**

Microgaster resplendens Wilkinson, 1929 : 106.

♀. Mesoscutum, tergite 1, the median field of tergite (2 + 3) and the whole of the underside of the gaster bright yellow ; the body otherwise black. Hind coxa and hind femur yellow ; hind tibia infusate at apex, the infuscation more extensive on outer side.

Top of head smooth, shining, virtually impunctate. Ocelli in a moderately high triangle, the posterior tangent to the anterior ocellus passing slightly in front of the other pair. Antenna rather thin, hardly as long as the body, with segment 17 about one and one third times longer than wide ; pubescence of flagellum somewhat bristly.

Mesoscutum highly polished and with only very superficial punctation. Scutellar disc slightly extended backwards to cover the base of the postscutellum ; the posterior extremities of the lateral rugose areas unusually wide apart (Text-fig. 257). Suture between the mesoscutum and the disc of the scutellum shallow, markedly convex in the forwards direction and consisting of an even row of numerous, small foveae. Areolet of the fore wing 4-sided, the 2nd transverse cubitus received onto the base of the 2nd abscissa of the radius. Vannal lobe with fringe of long sparse hairs throughout. Propodeum smooth, polished anterior half.

Tergite 1 with traces of rugosity on its posterior, turned over part. Ovipositor sheath broken, but judging from the length of the ovipositor, fully twice as long as the hind tibia.

Length: 3 mm. without ovipositor.

S. TASMANIA : Mt. Wellington, *TYPE* ♀ only.

Type in the British Museum (Nat. Hist.).

It is difficult to point to a relationship with any other group of species within *Hypomicrogaster*. On the shape of the areolet and the shape of the basal tergites, *resplendens* could not be excluded from the *vacillatrix*-group. But the species I put in this latter group have the hind spurs markedly different in length and the propodeum almost always with a medial keel.

The general appearance of the disc of the scutellum is the most striking feature of this species.

THE *MORATA*-GROUP

The two species I include in this group are not very closely related and the only difference of value between them as a group, and *resplendens* lies in the fact that they have a normal scutellar disc.

KEY TO SPECIES

FEMALES AND MALES

- A Hypopygium short, evenly sclerotised all over, without a trace of lateral creases ; ovipositor sheath hardly two thirds as long as the hind tibia ; hind coxa bright yellow ; 1st abscissa of the discoideus considerably shorter than the 2nd ; tergite 1 bright reddish-yellow, almost subquadrate ; vannal lobe beyond its widest part without fringe of hairs.
Ovipositor rather thick (Text-fig. 258) ; gaster bright reddish-yellow except for the dorsal surface posterior to the 1st tergite ; mesoscutum rather coarsely punctate, the punctures anteriorly becoming contiguous. Parameres of the male genitalia unusually large. *morata* (Wilkinson) ³⁹
AUSTRALIA: Victoria. Type in the British Museum (Nat. Hist.).
Host: *Thyridopteryx herrichi* Westwood (Psychidae).
- B Hypopygium long, membranous and tightly folded along the middle line but without lateral, longitudinal creases ; ovipositor sheath about one and one third times longer than the hind tibia ; hind coxa dark brown but paler at tip ; 1st abscissa of the discoideus a little shorter than the 2nd (Text-fig. 225) ; tergite 1 brown throughout, narrower and with an indication of punctate-rugosity along sides posteriorly ; vannal lobe beyond its widest part with distinct fringe of hairs (Text-fig. 264).
Ovipositor much less thick than in *morata* ; gaster yellow beneath but the whole of the upper surface brown ; mesoscutum, on the whole, with a very fine, superficial punctation. The male has tergite 1 more narrowed behind than the female ; the genitalia are without the exaggerated parameres of *morata* *ceto* sp. n.
AUSTRALIA: F. C. T., Blundell's, 1931, 2 ♀♀, one the TYPE, 3 ♂♂, bred, i.1931, from '*Eriococcus* complex on *Eucalyptus*', (A. L. Tonnoir). Type in the British Museum (Nat. Hist.).

THE *PSARAE*-GROUP

Ocelli in a very low triangle, the transverse, posterior tangent to the median ocellus cutting deeply into the posterior pair. Lateral, polished field of the scutellum not pushed far forwards and hence not cutting off between itself and the disc a long, parallel-sided furrow (cf. *zonaria*-group). First abscissa of the radius much longer than the 1st transverse cubitus ; 2nd transverse cubitus received onto the 1st considerably proximal to the junction of the two radial abscissae (Text-fig. 273). Vannal lobe beyond its widest part without a hair-fringe. Propodeum highly polished, and with strong, medial keel (Text-fig. 266). Longer spur of the middle tibia reaching apex of middle basitarsus and terminating in a long bristle.

The species of this group are large, heavily built insects, and some of them are entirely fulvous in colour. They form a very homogeneous unit.

³⁹*Microgaster morata* Wilkinson, 1929 : 106.

Hypomicrogaster morata (Wilkinson) **comb. n.**

KEY TO SPECIES

FEMALES

- 1 Fulvous species with at most the apex of the hind tibia and the whole of the hind tarsus blackened and sometimes the middle of tergite 1; edge of vannal lobe beyond its widest part more or less straight; median field of tergite (2 + 3) less transverse, subtriangular, better defined 2
- At least the thorax in greater part blackish; vannal lobe beyond its widest part concave; median field of tergite (2 + 3) more transverse, very poorly defined laterally.
- Face always coarsely rugose-punctate; mesoscutum, except posteriorly, sharply, strongly and distinctly punctate; mouth parts normal; neither glossa nor galea lengthened (Text-fig. 265) 4
- 2 Mouth parts greatly lengthened, the glossa deeply excised and the galea fully twice as long as wide (Text-fig. 269).
- Mesoscutum thickly pubescent but polished and without punctation; radius leaving stigma rather far distal to middle; tergite 1 more strongly narrowed to apex than in the next two species and with its distal, turned over part polished; median field of tergite (2 + 3) having a more pronounced subtriangular appearance than in the next two species *apo* (Wilkinson)⁴⁰
- PHILIPPINES: Luzon, Mt. Makiling, Atimonan (type locality); Los Baños; Mindañao. Type in the Zoological Museum, Berlin.
- Mouth parts not thus lengthened, the glossa at most slightly excised and the galea much less than twice as long as wide 3
- 3 Mesoscutum, at least over anterior half, thickly and quite conspicuously punctate; stigma emitting radius only slightly beyond middle (Text-fig. 260); fore wing with darkened apex as in the next species but proximal to this still markedly embrowned; head less transverse; face with more distinct evidence of punctation.
- Tergite 1 on each side, where it turns over, with a variable amount of rather strong punctation *papua* (Wilkinson)⁴¹
- PAPUA: Kokoda (type locality). Type in the British Museum (Nat. Hist.).
- There seems to be some variation in the point of emission of the radius on the stigma, some specimens showing it rather more distal than others.
- Mesoscutum in front with only the merest trace of punctation; stigma emitting radius more distinctly distal to middle; fore wing proximal to the darkened apex virtually hyaline; head more transverse (Text-fig. 274); face with much less distinct evidence of punctation.
- Antennal sockets more deeply set than in *papua*, the surface behind each socket somewhat hollowed out so that the rim of the socket is raised; the suture between the mesoscutum and the disc of the scutellum is divided by three costae, of which the middle one is the strongest, into four large foveae; in *papua* only the middle costa is developed (too much importance should not be placed on this difference between the species) *nephta* sp. n.
- PHILIPPINES: Mindañao, Dapitan, 1 ♀, the TYPE, (Baker). Type in the U.S. National Museum.
- This species is very closely related to *papua* but the differences seem to be sufficiently strong to justify a specific name. The apex of the hind tibia in *nephta* and the whole of the hind tarsus is blackened; tergite 1, where it turns over, is broadly darkened along the middle.

⁴⁰*Microgaster apo* Wilkinson, 1929: 108.*Hypomicrogaster apo* (Wilkinson) **comb. n.**⁴¹*Microgaster papua* Wilkinson, 1936: 86.*Hypomicrogaster papua* (Wilkinson) **comb. n.**

- 4 All the coxae dark, the hind pair virtually black ; tergite 1 not strongly narrowed posteriorly ; its apical width fully two thirds its greatest width (near base).
 Very dark species ; abscissa 1 of the radius longer than in the next two species and straight ; gaster, except sides of tergite 1, and beneath, entirely dark ; hind spurs brown ; areolet almost round ; larger than both *psarae* and *botydis*, ca. 6 mm. without ovipositor ***libanius* sp. n.**
 PHILIPPINES: Mindanao, Surigao, 1 ♀, the TYPE, 1 ♂, (*Baker*). Type in the U.S. National Museum.
- At least the front and middle coxae entirely yellowish and the hind pair pale at least at base ; tergite 1 more narrowed posteriorly or entirely yellow 5
- 5 Tergite 1 entirely yellow and apically about two thirds as wide as its greatest width ; gaster almost entirely yellow, darkening occurring only across the median field of tergite (2 + 3) or at middle of all tergites ; hind femur entirely reddish-yellow ; hind coxa darkened only on outer side apically ; head, in a facial view, not at all elongate ; mouth parts (Text-fig. 265) ; basal tergites (Text-fig. 276) ; fore wing (Text-fig. 273) ***psarae* (Wilkinson)⁴²**
 MALAYA. SIAM. Type in the British Museum (Nat. Hist.).
 Host: *Psara bipunctalis* F. (Pyralidae).
- Tergite 1 darkened on its turned over apical part, much more narrowed behind and at apex about half as wide as its greatest width ; within its excavated basal part it is contrastingly reddened ; gaster in greater part dark, broadly yellow along sides of tergite 1 and all over its ventral surface at base ; hind femur entirely brown ; hind coxa dark on about apical half, pale yellow towards base and, on outer side, with a tongue of darker colour extending into the yellow ; head, in a facial view, decidedly elongate (Text-fig. 267).
 The turned over, posterior part of tergite 1 is strongly, almost confluent punctate ***botydis* (Wilkinson)⁴³**
 SUMATRA. Type in the British Museum (Nat. Hist.).
 Host: *Botys marginalis* Warren on *Ipomaea* sp. and *Spilanthes acmella*. The name of the host is possibly an error for the Pyralid, *Psara marginalis* Warren (teste Wilkinson).
 The bicoloured 1st tergite and its strong, posterior constriction are characteristic features of this species ; the ovipositor sheath is longer than in *psarae* but the two species are otherwise very closely and naturally related.

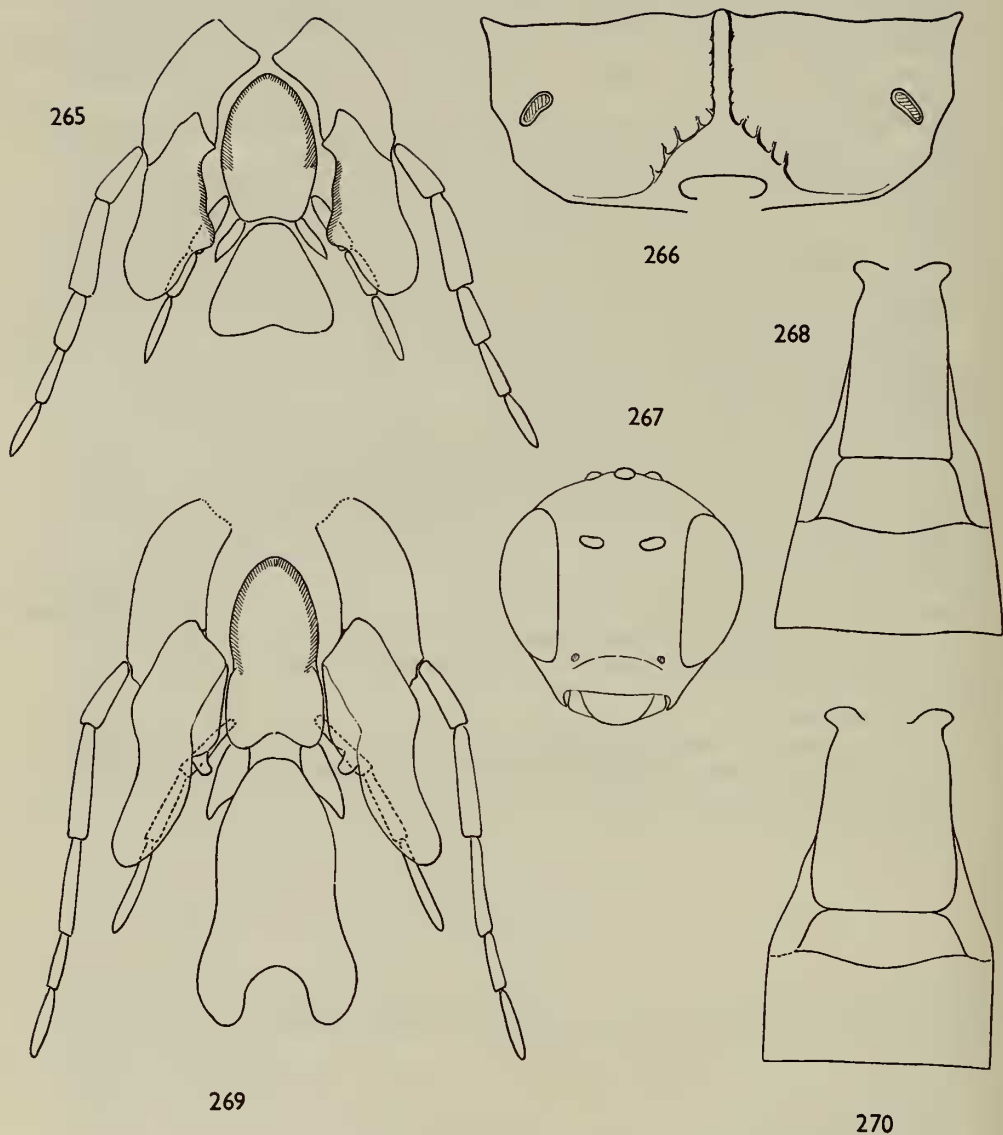
THE *VACILLATRIX*-GROUP

KEY TO SPECIES

FEMALES

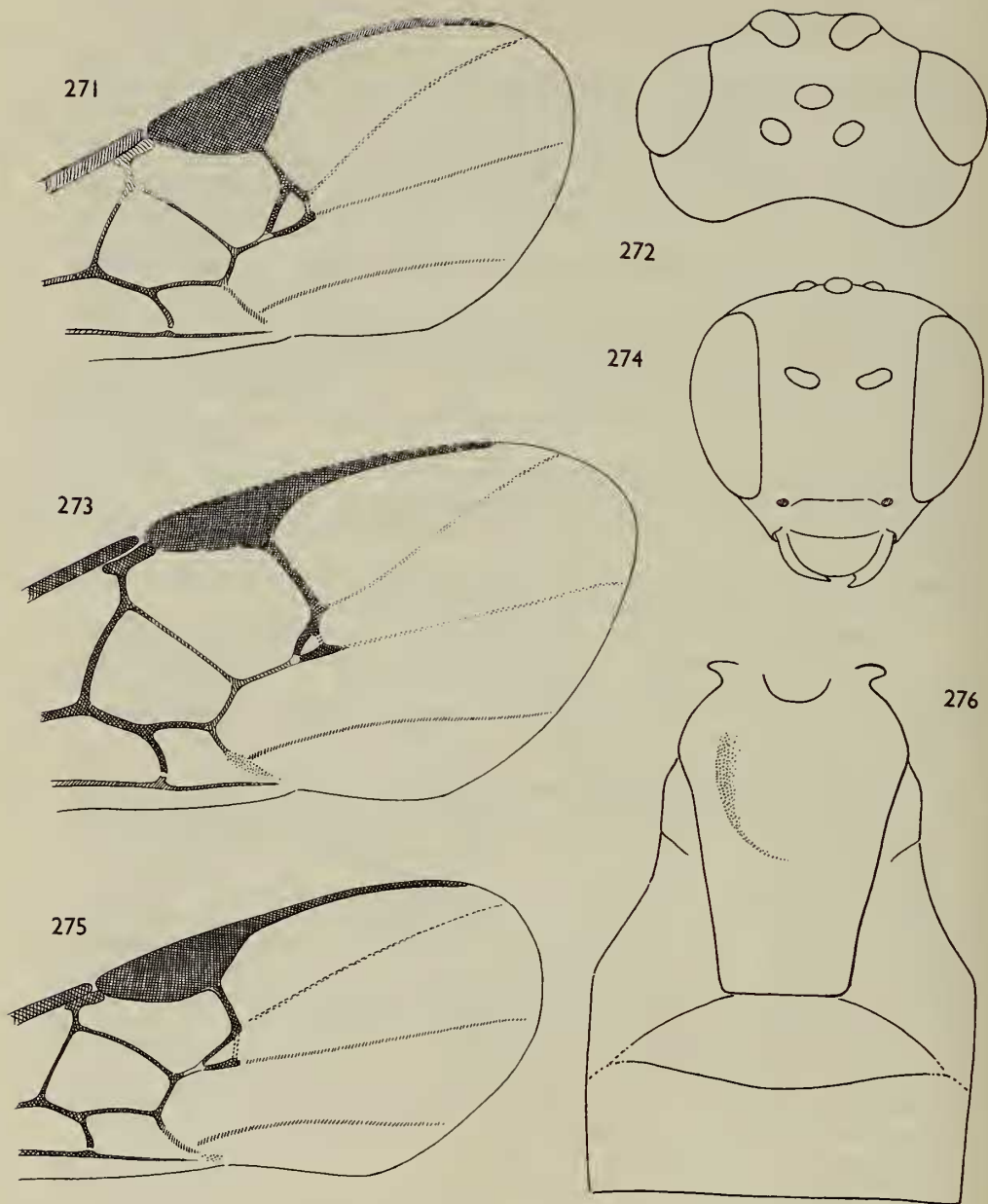
- 1 Flagellar segments 6-7, and sometimes 8, whitish ; hypopygium as heavily sclerotised along the middle line as elsewhere and not tightly folded here ; laterally without longitudinal creases. Africa ***laurae* de Saeger (p. 223)**
- Flagellum never banded with white ; hypopygium thin, membranous and, in death, tightly folded along the middle line ; along each side usually with numerous longitudinal creases 2
- 2 Mesoscutum entirely reddish-yellow 3
- Mesoscutum pale at most posteriorly and along the course of the notaulices 5
- 3 Tergite 1 strongly narrowed behind, wedge-shaped 4

⁴²*Microgaster psarae* Wilkinson, 1927 : 174.*Hypomicrogaster psarae* (Wilkinson) **comb. n.**⁴³*Microgaster botydis* Wilkinson, 1930b : 281.*Hypomicrogaster botydis* (Wilkinson) **comb. n.**



FIGS. 265-270. *Hypomicrogaster*, ♀: 265, *psarae* (Wilkinson), mouth parts; 266, same, propodeum; 267, *botydis* (Wilkinson), ♀, head, from in front; 268, *acarnas* sp. n., ♀, basal tergites. 269, *apo* (Wilkinson), ♀, mouth parts; 270, *metris* sp. n., ♀, basal tergites.

- Tergite 1 much less narrowed behind (Text-fig. 283) ; not noticeably wedge-shaped.
More than half the hind basitarsus yellow ; stigma short, rather broad (Text-fig. 271) ovipositor sheath fully as long as the hind tibia. Mediterranean region
suffolciensis Morley, var. (p. 228)
- 4 Inner spur of the hind tibia much longer than the outer one and reaching considerably beyond the middle of the hind basitarsus (Text-fig 279) ; mesopleurum blackish ; ovipositor sheath slightly shorter than the hind tibia. S. Africa *fomes* sp. n. (p. 223)
- Inner spur of hind tibia not so much longer than the outer one and hardly reaching beyond the middle of the hind basitarsus (Text-fig 280) ; mesopleurum reddish like the mesoscutum ; ovipositor sheath very slightly longer than the hind tibia. Morocco *semele* sp. n. (p. 224)
- 5 Mesoscutum pale on posterior half, the pale colour extending forwards along the course of the notaulices.
1st abscissa of the discoideus distinctly shorter than the 2nd 6
- Mesoscutum black or very dark brown with faint reddening posteriorly 7
- 6 Tergite 1 entirely reddish-yellow ; areolet of the fore wing 3-sided ; head more transverse (Text-fig. 272). Uganda *vacillatrix* Wilkinson (p. 224)
- Tergite 1 black ; areolet of the fore wing distinctly 4-sided ; head less transverse. S. Africa *apollion* sp. n. (p. 224)
- 7 Tergite 1 bright yellow, very strongly narrowed behind ; pronotal collar yellow and sharply contrasting with the dark brown mesoscutum. India . *irates* sp. n. (p. 225)
- Tergite 1 darkened at least apically and then it is not so strongly narrowed behind as in *irates* 8
- 8 Ocelli forming virtually an equilateral triangle, the distance between the posterior pair hardly less than the diameter of the median ocellus.
Thorax pale, its sides conspicuously reddish ; hind femur yellow ; hypopygium evenly sclerotised almost all over and with hardly a trace of lateral creases. Sierra Leone *helle* sp. n. (p. 225)
- Ocelli not forming an equilateral triangle, the distance between the posterior pair at least slightly greater than the diameter of the median ocellus 9
- 9 Hind femur black.
Tergite 1 not abruptly, roundly narrowed behind 10
- Hind femur yellow or if infuscate, then tergite 1 is abruptly roundly, narrowed behind. Wings brownish ; areolet distinctly 4-sided ; vannal lobe with a conspicuous fringe of hairs 11
- 10 Stigma unusually broad (Text-fig. 271), without a pale proximal blotch ; antenna as long as the body and of ordinary form ; ovipositor sheath fully as long as the hind tibia. Europe. Mediterranean region *suffolciensis* Morley (p. 228)
- Stigma of ordinary form but with a pale proximal blotch ; antenna shorter than the body, very thin, the apical segments very closely articulated and having a smooth, shiny appearance ; ovipositor sheath about three quarters as long as the hind tibia. Tergite 1 hardly narrowed behind. Europe *tiro* Reinhard (p. 229)
- 11 Antenna distinctly thickened apically, with segments 15-17 about one and one third times longer than wide ; face markedly paler than the top of the head ; mesoscutum dark brown with faint reddish flush behind and along the course of the notaulices ; antenna in a low triangle. S. Africa *gerontius* sp. n. (p. 226)
- Antenna not at all thickened apically, segments 15-17 being nearer to one and a half times longer than wide ; face as dark as the top of the head ; mesoscutum evenly black ; antenna in a higher triangle. S. Africa *loretta* sp. n. (p. 226)



FIGS. 271-276. *Hypomicrogaster*: 271, *suffolciensis* (Morley), ♀, fore wing, part; 272, *vacillatrix* (Wilkinson), ♀, head, from above; 273, *psarae* (Wilkinson), ♀, fore wing, part; 274, *nephta* sp. n., ♀, head, from in front; 275, *laurae* (de Saeger), ♀, fore wing, part; 276, *psarae* (Wilkinson), ♀, basal tergites.

***Hypomicrogaster laurae* (de Saeger) comb. n.**

Microgaster laurae de Saeger, 1944 : 61.

I am confident that I have interpreted this species correctly, though the S. African specimens I have examined are all darker in colour than those described by de Saeger.

♀. Hind coxa entirely yellow ; hind femur yellow but darkened along upper surface towards apex ; hind tibia and hind tarsus entirely brown. Body dark brown with the gaster yellowish beneath. Wings markedly smoky.

Ocelli in rather a low triangle, the transverse posterior tangent to the anterior ocellus virtually touching the posterior pair. Flagellum distinctly thickened towards apex, with segments 15-17 about one and third times longer than wide. Face with large, shallow punctures.

Mesoscutum densely, more or less contiguously punctate everywhere. Radius leaving stigma far distal to middle (Text-fig. 275) ; transverse cubitus more or less interstitial with 1st abscissa of radius ; vannal lobe with long fringe throughout.

Tergite 1 turned over far anterior to middle, dull, densely, finely rugose all over (Text-fig. 278). Ovipositor sheath about three quarters as long as the hind tibia.

BELGIAN CONGO : Rwindi (type locality). S. AFRICA : Cape Province, Katberg, 5 ♀♀ ; Zululand, Eshowe, 1 ♀ ; Pondoland, Port St. John, 1 ♀.

Type in Congo Museum, Tervuren.

This species was described by de Saeger as red testaceous. Of the specimens I have before me, only the female from Eshowe is intermediate in colour, having the head, mesoscutum and scutellum pale brown and the underside of the gaster more brightly yellowish than in the other S. African specimens.

This is a most distinct species on account of the pale banded flagellum and the shape of the first tergite. No other species in the group has either of these features.

***Hypomicrogaster fomes* sp. n.**

♀. Gaster entirely reddish-yellow except that the apex of tergite 1 and the median field of tergite (2 + 3) are darkened ; there is also slight medial infuscation on the following tergites. Hind coxa entirely yellow ; hind femur and hind tibia tipped with infuscation ; hind basitarsus pale at base. Wings very faintly tinted.

Face shiny and with hardly a trace of punctation. Ocelli not in a low triangle, the posterior, transverse tangent to the anterior ocellus not touching the posterior pair ; distance between the posterior ocelli twice the diameter of the anterior ocellus. Antenna rather thin, a little shorter than the body, tapering somewhat towards apex and with the preapical segment about one and one third times longer than wide.

Mesoscutum with slight satin-like sheen ; with only very fine, superficial punctation. The two fields of the propodeum highly polished. Areolet distinctly four-sided ; vannal lobe beyond its widest part with faint indication of a hair-fringe.

Tergite 1 quite strongly narrowed behind, its horizontal surface showing a few irregular rugosities. Ovipositor sheath a little shorter than the hind tibia.

Length: ca. 2.8 mm. without ovipositor.

S. AFRICA : Cape Province, Katberg, 1-10.ii.1933, 1 ♀, the *TYPE*, (R. E. Turner) ; Transkei, Umtata, 18.ii.-18.iii.1923, 1 ♀, (R. E. T.).

Type in the British Museum (Nat. Hist.).

The dark and pale parts of the colour of the hind leg are somewhat sharply contrasted in this species.

Hypomicrogaster semele sp. n.

♀. Very like *fomes*, from which it differs by little more than the characters given in the key. Although the thorax is much more reddened, tergite 1 is darker than in *fomes* and is blackened almost all over. The hind tibia is slightly more infusate at apex and the segments of the hind tarsus are a little more obviously marked with yellow at base.

Antenna slightly longer and not of such weak build. Areolet virtually triangular; hair fringe of the vannal lobe slightly more distinct. Propodeal keel weak and somewhat obscured by irregular rugosities. Ovipositor sheath fully as long as the hind tibia.

MOROCCO: Rabat, 3 ♀♀, one the *TYPE*, bred from *Simaethis nemorana*.

Type in the British Museum (Nat. Hist.).

Host: *Simaethis nemorana* Hübner (Glyphipterigidae).

This species and *fomes* are closely related and need to be carefully distinguished.

Hypomicrogaster vacillatrix (Wilkinson) comb. n.

Microgaster vacillatrix Wilkinson, 1930a: 155.

♀. Thorax extensively pale-marked, the propodeum being as yellowish as the posterior part of the mesoscutum. Gaster reddish-yellow except for medial infuscation on tergites (2 + 3)–6. Hind coxa and hind femur entirely reddish yellow.

Face shiny, virtually impunctate. Antenna weak, a little shorter than the body, tapered distally and with the preapical segment about one and one third times longer than wide. Posterior transverse tangent to the anterior ocellus hardly touching the posterior pair; posterior ocelli separated by a distance clearly greater than the diameter of the anterior ocellus.

Mesoscutum with faint satin-like sheen and fairly sharply punctate all over. The two fields of the propodeum smooth and polished. Vannal lobe beyond its widest part with distinct hair-fringe.

Tergite 1 shiny and with only faint rugosity on posterior part. Ovipositor sheath as long as the hind tibia.

UGANDA: Kampala (type locality).

Type in the British Museum (Nat. Hist.).

Host: *Filodes productalis* Hampson (Pyraustidae).

Hypomicrogaster apollion sp. n.

♀. This species is extremely like *vacillatrix*. Colour altogether darker, the dark and light areas of the mesoscutum being more sharply contrasted; propodeum blackened; whole of upper surface of gaster darkened.

Face considerably roughened towards the clypeus. Clypeus more transverse than in *vacillatrix*. Thorax less broad than in *vacillatrix* and hence appearing narrower in proportion to the width of head. Punctuation of the mesoscutum finer, less sharp and less distinct.

Length: ca. 2.8 mm. without ovipositor.

S. AFRICA: Pondoland, Port St. John, 1–11.vi.1923, 1 ♀, the *TYPE*, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

Hypomicrogaster irates sp. n.

♀. Head and thorax dark brown ; gaster dark brown beyond tergite 1 in the type series ; almost entirely yellow in other females. Hind femur darkened at extreme tip ; hind tibia becoming infusate on about apical third. Wings hyaline ; stigma with a faintly paler proximal spot.

Face very shiny, impunctate. Distance between the posterior ocelli hardly greater than the diameter of the median ocellus. Antennal almost as long as the body, fairly thick but slightly tapered towards apex ; flagellum somewhat bristly.

Mesoscutum very shiny and with at most a very superficial punctation. The two fields of the propodeum highly polished. Areolet distinctly four-sided ; 1st abscissa of the discoideus very slightly shorter than the 2nd ; vannal lobe with distinct hair-fringe throughout. Hind spurs whitish, the inner one much longer than the outer one and reaching distinctly beyond the middle of the hind basitarsus ; longer spur of the middle tibia reaching slightly beyond the apex of the middle basitarsus.

Tergite 1 strongly narrowed behind, its sides on the horizontal part straight (Text-fig. 277). Ovipositor sheath hardly more than two thirds as long as the hind tibia.

Length: 2.5 mm. without ovipositor.

INDIA : Bombay, N. Thana, Palghar Range, 3 ♀♀, 2 ♂♂, bred 2-22.x.1942, one the TYPE (♀, 2.x.1942) from *Hapalia machaeralis* defoliating *Tectona grandis* ; Dehra Dun, (1 ♀, bred 28.ix.1943, from *H. machaeralis*, 2 ♀♀, 2 ♂♂, bred 28.vii.-4.viii.1934 from *Sylepta lunalis* defoliating *Leea aspera*.

Type in the British Museum (Nat. Hist.).

Host : *Hapalia machaeralis* Walker ; *Sylepta lunalis* Guenée (Pyraustidae).

This species is superficially very like the African *fomes* differing from it most obviously in colour. Nevertheless, because the 1st abscissa of the discoideus is shorter than the 2nd in *irates*, I am inclined to think that it is more closely related to *vacillatrix* than to *fomes*, which has these abscissae of equal length. The affinities of *fomes* are, I think, with *suffolciensis* and *tiro* rather than with *vacillatrix* and *irates*.

Hypomicrogaster helle sp. n.

♀. Mesoscutum very dark brown to black ; disc of the scutellum slightly paler ; tergite 1 pale on anterior declivous part but becoming darkened on posterior horizontal part ; the underside of the gaster is bright reddish-yellow. Antenna yellowish beneath. Legs entirely yellow except that the hind tibia becomes infusate on about apical third and the hind basitarsus is more or less infusate all over.

Head in a facial view somewhat subtriangular (Text-fig. 282).

Face shiny, virtually impunctate. Antenna as long as the body, rather weak, slightly tapered apically, the preapical segment about one and one third times longer than wide ; flagellum markedly bristly.

Mesoscutum with fairly distinct punctation on anterior half. The two fields of the propodeum smooth, shining. Areolet four-sided ; 1st abscissa of the discoideus distinctly a little shorter than the 2nd ; vannal lobe with distinct hair-fringe throughout.

Tergite 1 rather short, not much narrowed behind (Text-fig. 285). Median field of tergite (2 + 3) with weak rugosity similar to that of the horizontal part of tergite 1. Ovipositor sheath a little shorter than the hind tibia.

Length: ca. 2.5 mm. without ovipositor.

W. AFRICA : Sierra Leone, Njala, 9 ♀♀, one the TYPE, bred 9.xi.1930, (*E. Har-*

greaves). U.C. Ibadan, 3 ♀♀, 23 vii.1958, 1♀, 4.x.1957, bred from *Lamprosema indica* (G. H. Caswell).

Type in the British Museum (Nat. Hist.).

Host : *Lamprosema indica* Saunders (Pyralidae).

H. helle seems to be largely characterized by the closeness of the posterior ocelli. This feature, in combination with the colour pattern and the shortness of the first tergite makes it easily separable from the other species belonging to the group.

Hypomicrogaster gerontius sp. n.

♀. Head slightly paler than the thorax. Disc of the scutellum sometimes faintly reddish like the posterior part of the mesoscutum. Gaster dark brown above; the sunken, basal part of tergite 1 is reddish. Hind coxa yellow; hind femur yellow but darkened apically; hind tibia and hind tarsus brown throughout.

The position of the ocelli is somewhat variable; sometimes the posterior, transverse tangent to the anterior ocellus appears to touch the posterior pair; sometimes it passes closely in front of them.

Mesoscutum shiny with faint satin-like sheen; its punctation very superficial, a character by which it differs at once from the closely related *loretta*. Propodeum smooth-looking but not polished; a few strong rugosities towards the posterior margin and near the strong medial keel. The 1st abscissa of the discoideus is very slightly shorter than the 2nd. Inner spur of the hind tibia not reaching beyond the middle of the hind basitarsus.

Horizontal part of tergite 1 dull and fairly strongly rugose all over. Ovipositor sheath about three quarters as long as the hind tibia.

Length: ca. 3 mm. without ovipositor.

♂. Six specimens, that I am confident belong with the female, are like the female in all respects, except for the usual sexual differences.

S. AFRICA : Natal, Van Reenen, Drakensberg, 1-22.i.1927, 3 ♀♀, one the *TYPE*, 2 ♂♂, (R. E. Turner); Cape Province, Somerset East, 10-22.xii.1930, 4 ♀♀, 3 ♂♂, (R. E. T.), Swellendam, 17.xii.1931-18.i.1932, 1 ♀, (R. E. T.).

Type in the British Museum (Nat. Hist.).

This species has the flagellum similar to that of *laurae*.

Hypomicrogaster loreta sp. n.

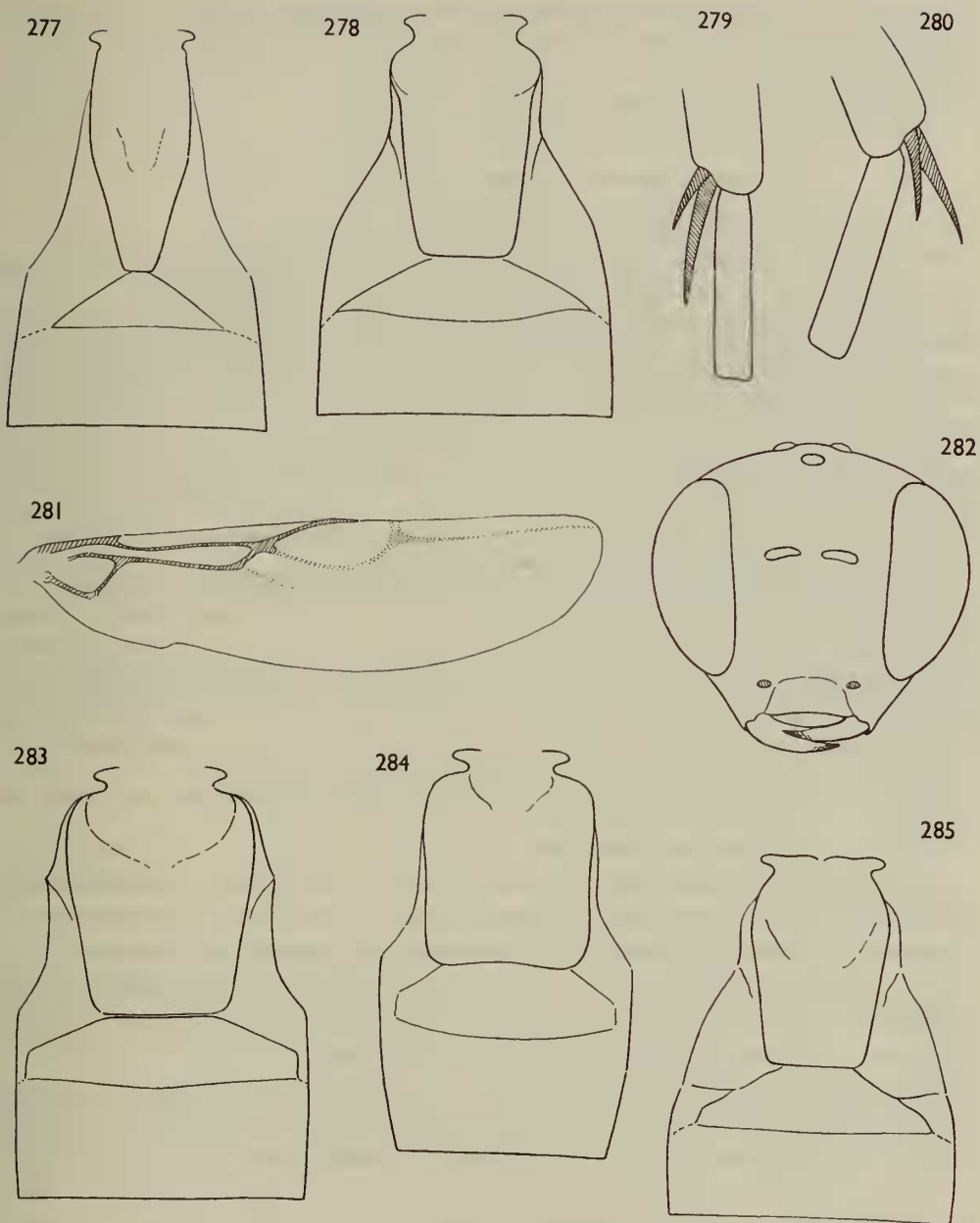
♀. Head blackish like the thorax but both these parts lacking the reddish glow that is a feature of *gerontius*. Scape yellow except for a dark mark on each side. Wings not so dark as in *gerontius*. Hind tibia becoming yellowish on about basal half and hence not so curiously contrasted with the yellow femur as in *gerontius* and *laurae*.

Face slightly less transverse than in *gerontius*. Antenna rather thin with the preapical segment about one and a half times longer than wide.

Mesoscutum very distinctly punctate. Disc of scutellum with sparse punctures. The two fields of the propodeum more shiny. Hind spurs whitish (they are brownish in *gerontius*), the inner one distinctly reaching beyond the middle of the hind basitarsus. First abscissa of the discoideus as long as the 2nd.

Tergite 1 not quite so strongly narrowed behind as in *gerontius* and its horizontal part considerably smoother.

Length: ca. 2.8 mm. without ovipositor.



FIGS. 277-285. *Hypomicrogaster*, ♀: 277, *irates* sp. n., basal tergites; 278, *laurae* (de Saeger), same; 279, *fomes* sp. n., ♀, hind spurs; 280, *semele* sp. n., ♀, hind spurs; 281, *Miopotes creon* sp. n., ♀, hind wing. *Hypomicrogaster*, ♀: 282, *helle* sp. n., head, from in front; 283, *suffolciensis* (Morley), basal tergites; 284, *tiro* (Reinhard), same; 285, *helle* sp. n., same.

S. AFRICA : Cape Province, Katberg, 4,000 ft., xii.1932, 1 ♀, the *TYPE*, x.1932, 2 ♀♀, George, 15-17.xi.1921, 1 ♀ ; Natal, Van Reenen, Drakensberg, xi.1926, 2 ♀♀, (all *R. E. Turner*).

Type in the British Museum (Nat. Hist.).

***Hypomicrogaster suffolciensis* (Morley) comb. n.**

Microgaster suffolciensis Morley, 1902 : 4, ♂ [not ♀].

This species is essentially characterized by its broad stigma and on this feature alone differs from all the other species I have included in the group.

♀. Colour very variable. British examples have the thorax entirely black with the gaster broadly reddish-yellow along each side. In the Mediterranean region more brightly coloured forms occur ; two out of four females from Cyprus have the head black, the mesoscutum entirely red and the gaster almost entirely red ; a third female is coloured like British specimens and a fourth is almost entirely black with the hind femur also black but showing a paler flush along each side ; in all other examples, no matter from where, the hind femur is entirely reddish-yellow. A single female from Oran (in coll. Granger, Paris) has the thorax almost entirely red, there being slight darkening only on mesosternum, posterior part of mesopleurum and along middle of propodeum. The species is constant in having the hind tarsal segments basally annulated with yellow ; this is a distinct feature of complementary value.

Antenna almost as long as the body, tapering slightly towards apex with the preapical segment fully one and one third times longer than wide. Distance between the posterior ocelli nearly twice the diameter of the median ocellus.

Mesoscutum in front with a fine, indistinct punctuation ; over its greater, posterior part, smooth-looking and virtually impunctate. The two fields of the propodeum highly polished. Stigma of fore wing (Text-fig. 271) ; 1st abscissa of the discoideus fully as long as the 2nd ; vannal lobe beyond its widest part with a hardly noticeable fringe of minute hairs. Hind spurs whitish, the inner one reaching slightly beyond the middle of the hind basitarsus.

Tergite 1 not very strongly narrowed behind (Text-fig. 283), its horizontal surface strongly and evenly rugose. Ovipositor sheath fully as long as the hind tibia.

Length: ca. 3.5 mm. without ovipositor.

In describing this species, Morley evidently mistook a slightly extruded part of the male genitalia for an ovipositor ; he describes this " ovipositor " as subexserted.

EUROPE. CYPRUS. N. AFRICA. Type in the British Museum (Nat. Hist.).

Host : Bred in England by R. L. E. Ford from:—*Rhodaria aurata* Schiffermüller (Pyralidae) on *Mentha* ; *Nephopteryx obductella* Fischer von Röslenstamm (Pyralidae). The parasite, solitary, emerges from these hosts in July.

In considering the British fauna alone, I have always been inclined to regard *suffolciensis* as being related to *Apanteles parasitellae* Bouché, a species in which the areolet is distinctly open and the propodeal keel at most suggested by a line of crowded, vermiculate rugosities, but which in all other respects resembles *suffolciensis*. *Apanteles parasitellae* bears also a close resemblance to the *mycetophilus*-group of *Apanteles* and possesses only the most subtle characters by which it can be excluded from that group. It thus seems to be transitional between *Hypomicrogaster* and *Apanteles* and its existence stresses the doubtful value of the form of the areolet as a criterion for separating *Apanteles* from most of the other microgasterine genera. I do not, however, really think that the *mycetophilus*-group of *Apanteles* is related through

A. parasitellae to the *vacillatrix*-group of *Hypomicrogaster*. The affinities of *parasitellae* may truly be with *suffolciensis* and its resemblance to the *mycetophilus*-group fortuitous and the result of a convergence that so far resists a convenient form of taxonomic treatment. I confess that I have not been able to find a satisfactory solution to the problem but feel, nevertheless, obliged to draw attention to it.

***Hypomicrogaster tiro* (Reinhard) comb. n.**

Microgaster tiro Reinhard, 1880 : 357.

♀. This species seems to be closely related to *suffolciensis* differing from it by little more than the characters given in the key. The form of the flagellum offers a striking diagnostic feature by which the species can be instantly separated from the other species of the group.

Gaster darkened above and at sides. Hind femur blackened with at most a pale flush along each side.

Tergite 1 is only slightly or hardly at all narrowed behind and in this respect the species again differs from all the others (Text-fig. 284) ; the horizontal part of tergite 1 is strongly, evenly rugose.

EUROPE. Location of type doubtful.

Host : Bred in England from the following species of *Cnephasia* (Tortricidae) :—*chrysanthemana* Duponchel, *pascuana* Hübner, *virgaureana* Treitschke (now *interjectana* Haworth).

The pale spot at the base of the stigma is a useful additional character for recognising this species.

PROMICROGASTER Brues and Richardson

Promicrogaster Brues and Richardson, 1913 : 499 ; Muesebeck, 1958 : 416.

Monobasic.

I do not know the type-species and have based my concept of the genus on Muesebeck's remarks about it and a paratype female of *P. munda* Muesebeck which he was good enough to lend me for study.

The genus is essentially neotropical and I am not at all sure that I am right in including it in a small group of two species from Australia.

Head often markedly subtriangular in a facial view, except in the Australian *dissors*-group. Ocelli always in a higher triangle than in the neotropical species of *Hypomicrogaster*. Pronotum with a dorsal furrow. Areolet of the fore wing very small, the 2nd transverse cubitus arising from the 1st transverse cubitus (Text-fig. 286).

KEY TO SPECIES-GROUPS

- A Head in facial view slightly transverse ; mouth parts of ordinary form ; lateral, polished field of scutellum only weakly convex in the forwards direction and hence cutting off between itself and the disc of the scutellum a rugose tongue that narrows behind (Text-fig. 287) ; edge of vannal lobe beyond its widest part very slightly convex and here with a complete fringe of minute hairs.

Head rather deep from back to front ; radial cell narrow ; hind spurs subequal, two fifths as long as the hind basitarsus ; tergite 1 slightly narrowed behind, finely punctate or rugose-punctate ; hind femur entirely dark ; hind tibia yellowish only at base. Ovipositor sheath one and one third times as long as the hind tibia.

Australia **dissors-group** (p. 230)

- B Head in a facial view at least never as transverse as in the *dissors*-group, usually triangular or subtriangular ; lateral polished field of the scutellum strongly convex in the forwards direction and cutting off between itself and the disc a narrow, parallel-sided furrow (Text-fig. 288) ; edge of vannal lobe beyond its widest part usually concave and here without trace of a hair-fringe or, if more or less straight, then the edge with an occasional, minute, projecting hair.

Head strongly transverse ; setae of tergites 4-6 reduced more or less to a single row **munda-group** (p. 232)

THE DISSORS-GROUP

KEY TO SPECIES

FEMALES

- A Mesoscutum smooth-looking but not polished, having an extremely fine, superficial punctation ; legs extremely slender, segment 3 of the hind tarsus being very distinctly longer than 5 ; outer surface of the hind tibia with very sparse, hardly outstanding spines ; hind tibia yellowish on about basal two-fifths ; antenna very slender, segment 6 being fully twice as long as wide ; head thicker from back to front ; 1st abscissa of the radius and the 1st transverse cubitus angled at their junction, almost right-angled ; 1st abscissa of the discoideus distinctly shorter than the 2nd (Text-fig. 293).

Wings rather strongly brownish ; form considerably more slender than that of the next species ; length ca. 3.5 mm. without ovipositor . . . **dissors** sp. n.

AUSTRALIA: F. C. T., Black Mts., 28.v.1930, 1 ♀, the TYPE, (*W. Rafferty*). Type in the British Museum (Nat. Hist.).

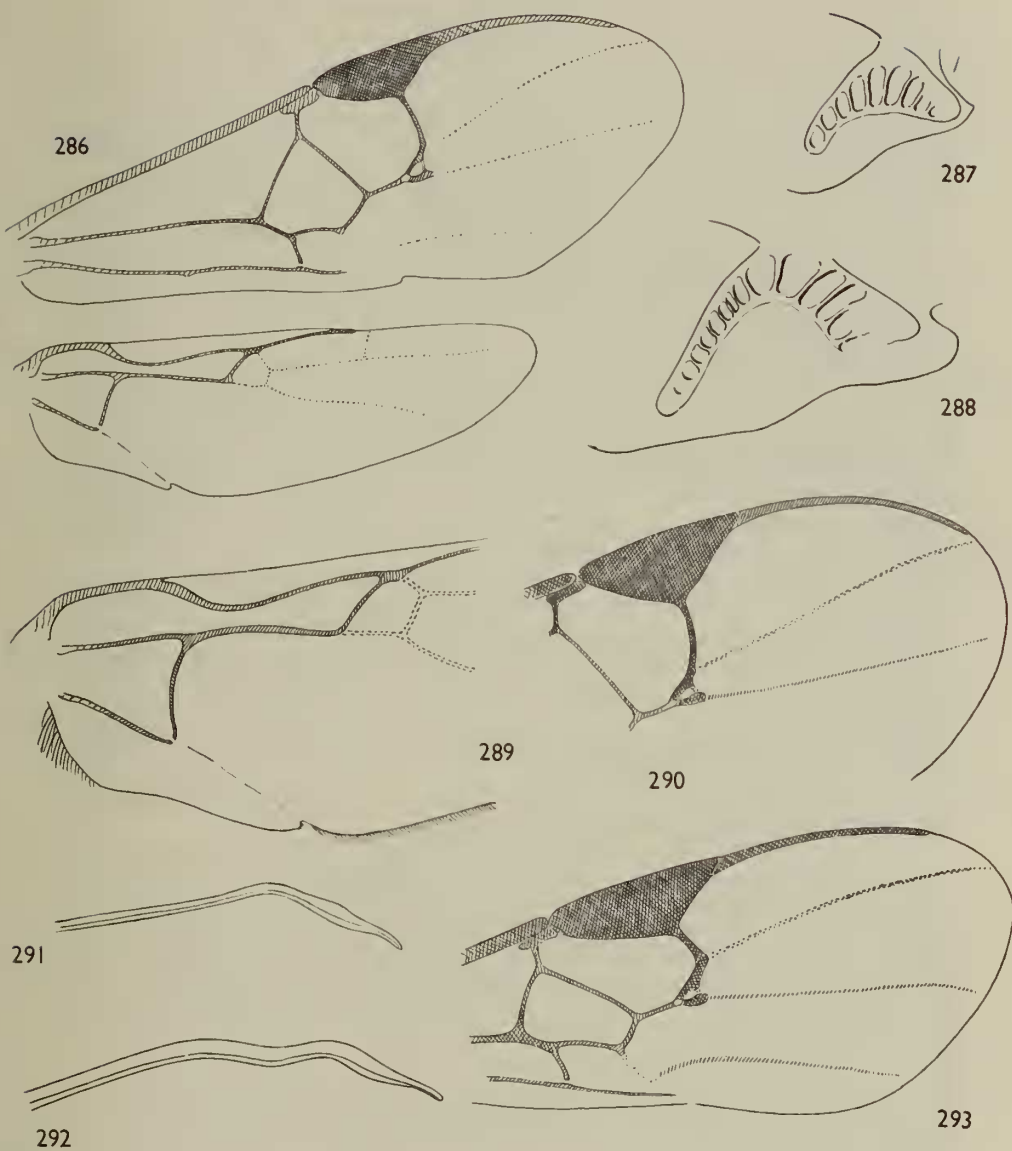
In general habitus, especially as regards the shape of the gaster, this species much resembles *spilopterus* of the *munda*-group.

- B Mesoscutum highly polished but with an indication of vague punctation anteriorly ; scutellum a little shorter and narrower than in *dissors* ; legs much less slender, the 3rd segment of the hind tarsus much more thickly and obviously spinose, the spines more upstanding and giving the tibia a somewhat prickly appearance ; antenna much less slender, segment 16 being about one and one third times longer than wide ; head less thick from back to front ; 1st abscissa of the radius and the 1st transverse cubitus less obviously angled at their junction ; 1st abscissa of the discoideus not shorter than the 2nd ; hind tibia pale on about basal quarter.

Metacarp shorter in proportion to the length of the stigma than in *dissors* ; length 2.5 mm. without ovipositor **calacte** sp. n.

AUSTRALIA: Victoria, Melbourne, 1 ♀, the TYPE ; F. C. T., Brindabella, 24.xi.1931, 1 ♀, (*L. F. Graham*). Type in the British Museum (Nat. Hist.).

The ovipositor of this species is almost straight and very thin. The gaster of both *calacte* and *dissors* is predominantly dark brown with paler colouring at sides of tergites 1 and 2 and to a less extent 3. *Promicrogaster calacte* has much the habitus of species of the *vacillatrix*-group, the main difference being in the form of the areolet and the relatively shorter spurs of the hind tibia.



FIGS. 286-293. *Promicrogaster*, ♀: 286, *carus* sp. n., wing; 287, *dissors* sp. n., lateral, rugose area of scutellum; 288, *munda* Muesebeck, same; 289, same, hind wing, part; 290, *sterope* sp. n., fore wing, part; 291, *sterope* sp. n., apex of ovipositor, lateral; 292, *apharea* sp. n., same; 293, *dissors* sp. n., fore wing, part.

THE *MUNDA*-GROUP

KEY TO SPECIES

FEMALES

- 1 Hind spurs very short, the inner one only about one quarter as long as the hind basitarsus.

Hind coxa in greater part blackish; flagellum extremely slender, with segment 17 about one and a half times longer than wide; pubescence of the flagellum so fine as to be hardly noticeable; mesoscutum with a fine, very dense punctation; propodeum on each side of the middle third polished; nervellus of the hind wing straight and directed slightly inwards on the vannal lobe side; submediellan cell of the hind wing setose all over; cubitellan cell very distinctly wider than high; ovipositor sheath fully two and one third times longer than the hind tibia; in a dorsal view of the thorax, the metapleurum is strongly bulging; hind femur yellowish with darkened apex

- Hind spurs longer, the inner one at least one third as long as the hind basitarsus 2
 2 Tergite 3 entirely smooth; tergite 1 polished at least along most of its medial surface, more narrowed behind; vannal lobe rather deeply concave beyond its widest part and here without trace of projecting hairs; head, in a facial view, slightly more elongate and the mouth parts obviously lengthened (Text-fig. 254). Length: 4 mm. without ovipositor *spilopterus* sp. n. 3

BRAZIL: Nova Teutonia, 13.xi.1937, 1 ♀, the TYPE, 10.x.1935, 1 ♀, (Plaumann). Type in the British Museum (Nat. Hist.).

- Tergite 3 with a very large median zone covered with fine, longitudinal striation; tergite 1 densely rugose all over and with longitudinal elements in the sculpture; vannal lobe not concave beyond its widest part, shorter and less narrowed apically than in *spilopterus*, and its edge beyond its widest part with an occasional projecting hair; head in a facial view slightly less elongate; mouth parts less obviously lengthened *erigone* sp. n.

BRAZIL: Nova Teutonia, 21.v.1937, 1 ♀, the TYPE, 14.ix.1938, 1 ♀, (Plaumann). Type in the British Museum (Nat. Hist.).

- 3 Tergite 1 markedly widened behind, strongly humped at middle, strongly shining and with only weak traces of rugosity towards apex.

Legs, including the hind coxa but excluding the apex of the hind tibia and the whole of the hind tarsus, bright reddish-yellow; gaster strikingly bicoloured; the whole of the upper surface dark brown and the underside intense reddish-yellow; head, in a facial view, markedly triangular (Text-fig. 256); clypeus yellow and deeply emarginate; antenna as long as the body, with the preapical segment twice as long as wide; 1st abscissa of the discoideus distinctly shorter than the 2nd and as long as the nervellus; temples and mesoscutum finely, densely punctate; propodeum with indication of a weak medial keel, its surface otherwise weakly rugose; nervellus of the hind wing virtually straight; median field of tergite (2 + 3) about three times as wide as long, highly polished; the long, narrow gaster highly polished, its hairs reduced to a single row on each segment; ovipositor sheath fully one and one third times longer than the hind tibia. Length: ca. 4 mm. without ovipositor *prater* sp. n.

BRAZIL: Nova Teutonia, 2.xi.1938, 1 ♀, the TYPE, (Plaumann). Type in the British Museum (Nat. Hist.).

Aberrant within the group on account of the shape of the 1st segment of the gaster and perhaps wrongly placed here. The general appearance of the gaster is striking. I know of no close allies.

- Tergite 1 not at all widened behind, usually narrowed and, if polished, then the median field of tergite (2 + 3) much more transverse 4

- 4 Nervellus of the hind wing curved outwards on the vannal lobe side (Text-fig. 289).

Gaster in large part red ; fully basal half of tergite 1 red and the remaining segments red except a brown transverse mark on each of them ; hind coxa very large, red, more than half as long as the gaster ; segment 17 of the antenna abruptly shorter than 16, about one and one third times longer than wide ; propodeum rather coarsely rugose with a poorly defined, elongate medial furrow ; ovipositor sheath about one and two thirds as long as the hind tibia ; median field of tergite (2 + 3), (Text-fig. 238) ; 1st abscissa of the discoideus as long as the 2nd *munda* Muesebeck⁴⁴

HONDURAS: type locality. MEXICO: Pichon, 1 ♀, labelled "paratype, *Promicrogaster munda* Mues.", (R. & K. Dreisbach), Morelos, 1 ♀, (Koebel), in British Museum (Nat. Hist.). Type in the U.S. National Museum.

- Nervellus of the hind wing not thus curved outwards on the vannal lobe side 5
5 Tergite 1 more or less yellow except for faint apical infuscation.

Gaster bright yellow with a dark patch on each tergite ; hind coxa yellow ; propodeum smooth, polished on each side of middle ; tergite 1 polished except for weak traces of rugosity posteriorly ; face with satin-like sheen but virtually impunctate ; inner spur of the hind tibia almost half as long as the hind basitarsus ; 1st abscissa of the discoideus as long as the 2nd ; wings (Text-fig. 286) ; flagellum less slender than in *spilopterus* and *erigone*, its pubescence upstanding and fairly conspicuous ; segment 17 twice as long as wide ; posterior ocelli close together, the distance between them equal to the diameter of the anterior ocellus ; ovipositor sheath twice as long as the hind tibia. In a facial view, the head is markedly triangular and, seen from above, not so transverse as in *polyporicola* *carus* sp. n.

BRAZIL: Bahia, 1930, 2 ♀♀, one the TYPE, 1 ♀, Bondar. Type in the British Museum (Nat. Hist.).

- Tergite 1 blackened and rugose all over 6
6 Vannal lobe beyond its widest part very distinctly concave and here without trace of a hair-fringe or projecting hairs.

Hind coxa obscurely yellow but darkened at base ; face distinctly, clearly punctate ; propodeum strongly rugose almost all over ; tergite (2 + 3) transverse, with its basal field very strongly transverse and its lateral corners narrowed to a fine point (Text-fig. 239) 7

- Vannal lobe not at all concave beyond its widest part and here with occasional projecting hairs ; median field of tergite (2 + 3) less narrowed laterally (Text-fig. 237).
Hind coxa entirely bright yellow 8

- 7 Tergite 1 short, only slightly longer than its basal width and hardly narrowed behind (Text-fig. 239) ; temples shiny and with only an obsolescent punctuation ; areolet so small as to be almost absent ; segment 17 of the antenna about one and one third times longer than wide ; postero-lateral corner of mesoscutum showing as a pale reddish, rounded boss ; gaster short with tergites 4-6 narrowly margined with white ; ovipositor with a less conspicuous apical sinuation than in the next species
polyporicola Muesebeck⁴⁵

Barro Colorado Is., Canal Zone. Type in U.S. National Museum

- Tergite 1 longer, more distinctly narrowed behind ; temples dull, rather strongly rugose-punctate ; areolet slightly more distinct ; segment 17 of the antenna about one and two thirds times longer than wide ; postero-lateral corner of the mesoscutum hardly developed and not paler than the rest of the mesoscutum ; gaster longer, the tergites without white apical margins ; apical sinuation of the ovipositor more conspicuous (Text-fig. 292).

Mesoscutum less shiny than in *polyporicola*, the punctures closer and distinctly more crowded along the imaginary course of the notaulices. Ovipositor sheath fully

⁴⁴*Promicrogaster munda* Muesebeck, 1958 : 422

⁴⁵*Promicrogaster polyporicola* Muesebeck, 1958 : 423.

one and a half times longer than the hind tibia, a little longer than in *polyporicola*. Legs more slender than in *polyporicola* and tergite 1 more strongly rugose. Length: ca. 4 mm. without ovipositor.

MEXICO: Guerrero, Omilteme, 8,000 ft., viii., 1 ♀, the TYPE, Chilpancingo, 4,600 ft., ix., 1 ♀, (*H. H. Smith*). BRAZIL: Nova Teutonia, 3.x.1938, 1 ♀, (*Plaumann*). Type in the British Museum (Nat. Hist.).

Neither this species nor *polyporicola* has the head noticeably triangular in a facial view.

- 8 Propleurum infusate; radius not closing the radial cell; tergite (2 + 3) beyond the median field with a median patch of fine striation; tergites (2 + 3)–5 with a sharply discrete yellow apical band and tergite (2 + 3) itself with its brown surface appearing emarginate on each side because of a large, lateral yellow patch; ovipositor sheath twice as long as the hind tibia, paler on basal half. *merella* sp. n.

BRAZIL: Nova Teutonia, 2.ix.1935, 1 ♀, the TYPE, (*Plaumann*). Type in the British Museum (Nat. Hist.).

Related to *spilopterus* but differing chiefly in having relatively longer hind tibial spurs and shorter ovipositor sheath; the metapleurum is slightly less bulging than in *spilopterus*.

- Propleurum yellow; radius almost completely closing the radial cell (Text-fig. 290); tergite (2 + 3) beyond the median field without medial striation; almost the apical half of tergite (2 + 3) yellow testaceous but the pale area not sharply discrete as in *merella*; tergites 4 and 5 with a similarly broad, pale, apical band; ovipositor sheath shorter, about one and one third times longer than the hind tibia, evenly darkened throughout.

Hypopygium bright yellow; tergite 1 rather short, not narrowed behind, and, like the short, more or less evenly rectangular median field of tergite (2 + 3), strongly rugose (Text-fig. 237) *sterope* sp. n.

BRAZIL: Nova Teutonia, 9.ix.1938, 1 ♀, the TYPE, (*Plaumann*). Type in the British Museum (Nat. Hist.).

This is a somewhat isolated species, characteristic on account of the unusually long radius. The head, in a facial view, is not at all elongate, but the clypeus shows the same type of emargination as occurs in *apharea*. Apex of ovipositor (Text-fig. 291).

PROTOMICROPLITIS Ashmead gen. rev.

Protomicroplitis Ashmead, 1898 : 167 [No species].

Protomicroplitis Ashmead, 1900 : 292 [species included].

Type-species : *Protomicroplitis medius* Cresson, first included species (Ashmead, 1900).

I have based my interpretation of the genus on a specimen of *medius* from Cuba named by Muesebeck and kindly lent to me by W. R. M. Mason.

I am using *Protomicroplitis* to contain a large number of species-groups, often very different among themselves but all, I think phylogenetically related and representing a different line of descent from the species-groups I have included in *Hypomicrogaster* and *Promicrogaster*. It may be found useful later on to raise some of these species-groups to generic status but such a step should, I am convinced, be taken only on the basis of wider study than I have carried out.

In *Protomicroplitis*, tergites 1 and (2 + 3) are subject to great variation but never form the combination of shapes that characterizes the two other genera mentioned

above. The hypopygium is always evenly sclerotised throughout and does not show lateral, longitudinal creases. The ovipositor is always very short. The edge of the vannal lobe is straight or convex beyond its widest part and here shows at least a few minute, projecting hairs (the *ippis*-group and *lelaps* of the *lelaps*-group are exceptional).

Most of the species I have examined have the posterior, polished band of the scutellum interrupted at middle by a small area of rugosity that is an extension of the rugosity of the disc of the scutellum. This is the most important character for recognising *Protomicroplitis* and applies to both sexes.

For reason of convenience I have included *Microgaster tegularis* Szepligeti in *Protomicroplitis*, giving it group status for the sake of consistency, though I doubt very much if it is correctly placed here. Unfortunately I know it only from the type, a male.

KEY TO SPECIES-GROUPS

FEMALES

- 1 Posterior, polished band of the scutellum interrupted at middle by a small area of rugosity that may be continuous with the rugosity of the scutellar disc or separated from this by a short transverse keel or lip ; or this small area of rugosity may be contrasted with an almost smooth scutellar disc 2
- Posterior, polished band of the scutellum not interrupted at middle by rugosity (except rarely a few punctures present in *lelaps*-group) 18
- 2 Inner spur of the hind tibia about one quarter as long as the hind basitarsus.
Legs long, thin ; 2nd transverse cubitus arising from the radius so that the areolet is 4-sided ; median field of tergite (2 + 3) showing as an elongate, ill defined, finely aciculate area. S. Africa **reales-group** (p. 239)
- Inner spur of the hind tibia always longer than half the hind basitarsus, usually about two thirds as long 3
- 3 Tergite 3 as heavily sclerotised as 2, the two tergites together forming a sculptured carapace, beneath which the more apical tergites are completely or in part hidden.
2nd transverse cubitus reduced to a mere hyaline point. Old and New World **basimacula-group** (p. 244)
- Tergite 3, that is, posterior half of tergite (2 + 3), always smooth, polished and never forming with 2 a carapace such as above 4
- 4 Metacarp very short, hardly one and a half times as long as its distance from the apex of the radial cell (Text-fig. 294) ; lateral, polished field of scutellum reduced to a thin, parallel-sided strip (Text-fig. 323).
Propodeum polished and with medial keel ; middle tarsus very short (Text-fig. 295) ; claws of female long, bent almost at right angles and armed with a fine basal tooth. Philippines **periander-group** (p. 240)
- Metacarp rarely as short as this and then the propodeum is sculptured all over (*spretus*-group) ; lateral, polished field of scutellum at least distinctly convex anteriorly (Text-fig. 321) 5
- 5 Anterior margin of the postscutellum closely applied to the posterior margin of the scutellum so that, laterally, the phragma of the scutellum is completely concealed ; lateral sulci of tergite 2, if distinct at all, either directed towards the lateral margin of the tergite and incomplete, or, if they appear to enclose a median field, then this field is not widened behind (except in the *ippis*-group but in this group tergite 1 is very long, linear and constricted medially) 6

- Anterior margin of the postscutellum not closely applied to the posterior margin of the scutellum so that, laterally, the phragma of the scutellum is narrowly visible (Text-fig. 321) ; lateral sulci of tergite 2 enclosing an elongate, subtriangular field that is slightly widened behind.
 Tergite 1 strongly narrowed behind, wedge-shaped ; 1st abscissa of the discoideus very distinctly shorter than the 2nd ; 2nd transverse cubitus arising from the base of the 2nd abscissa of the radius ; 1st abscissa of the radius much longer than the 2nd. Europe. Philippines **marginatus-group** (p. 239)
- 6 Stigma emitting radius much distal to middle (Text-fig. 331) ; tergite 1 very long, narrow, constricted medially and dilated apically.
 1st abscissa of the discoideus much shorter than the 2nd 7
 Stigma emitting radius at most slightly beyond middle ; tergite 1 never of this form 8
- 7 2nd transverse cubitus more or less interstitial with the 1st abscissa of the radius so that the areolet is virtually 3-sided (Text-fig. 331) ; stigma bright yellow on at least basal half ; hind coxa yellow, polished ; tergite 2 without a clearly delimited, median field. N. America **calliptera-group** (p. 261)
- 2nd transverse cubitus joined with the 2nd abscissa of the radius so that the areolet is very large, 4-sided (Text-fig. 335) ; stigma black ; hind coxa black, very large, its upper surface extremely coarsely reticulate ; tergite 2 with an extremely narrow median field that abruptly dilates apically.
 Disc of scutellum thickly covered with almost golden, setiform hairs. Brazil
ippis-group (p. 263)
- 8 Tergite 2 with a more or less distinct median field that varies in shape from longitudinal-oval to long, narrow, more or less parallel-sided but is never triangularly widened posteriorly, though sometimes widened anteriorly.
 This field is not enclosed by the normal lateral sulci of tergite 2 ; these are usually indicated by a pit or small elongate depression but may sometimes form, as in the *pyrene*-subgroup, deeply channelled grooves bordering the tergite as far as the 2nd suture. Old and New World, mainly tropical . **xanthaspis-group** (p. 240)
 Almost all species have the mesoscutum and disc of scutellum heavily punctate ; sometimes the grooves that enclose the median field of tergite 2 curve outwards posteriorly towards the lateral margin of the tergite so that the tergite appears to be divided into three parts ; in such cases, tergite 1 is narrow and more or less parallel-sided and tergite 3 is always smooth.
- Tergite 2 either without such a delimited field or if one is present then tergite 1 is short and triangularly widened posteriorly 9
- 9 Tergite 2 divided by two curved, more or less rugose furrows into three fields of which the middle one is triangular and narrowest behind (Text-fig. 319).
 Tergite 1 short, very broad, strongly widened behind ; antenna of female very short, with segments 10-12 hardly longer than wide ; metacarp hardly one and a half times longer than its distance from the apex of the radial cell ; stigma short, broad ; scape long ; tergite 3 always polished. Old World . **spretus-group** (p. 255)
- If tergite 2 shows any indication of such a division into three fields (as in *scotica*-group), then tergite 3 shows considerable rugosity and/or the antenna of the female is normal 10
- 10 Tergite 2 smooth, polished (though often with more weakly sclerotised areas laterally) the lateral sulci indicated at most by short furrows at base of segment 11
- Tergite 2 rugose more or less all over 13
- 11 Tergite 1 about as wide as long, strongly, triangularly widened behind ; tergite 2 (as delimited by the 2nd suture which is itself convex in the anterior direction) transverse without any indication of a median field and appearing as a polished, evenly sclerotised segment that occupies the full width of the gaster ; side of pronotum polished and with deep, dorsal furrow (Text-fig. 320).

Areolet extremely small, reduced to a mere slit (Text-fig. 333). Brazil

***schunkei*-group** (p. 260)

- Tergite 1 always considerably longer than wide ; tergite 2, if delimited, then not, or not very obviously, transverse (frequently the lateral sulci are indicated as short, almost transverse furrows that tend to cut off a small, more weakly sclerotised area at each anterior corner of the segment) ; side of pronotum with at most a weakly indicated, rugulose, dorsal furrow 12
- 12 Mesoscutum at most rather finely, discretely punctate, very shiny ; head above smooth, polished.

Second transverse cubitus received onto the distal extremity of the 1st transverse cubitus and hence almost interstitial with the 1st abscissa of the radius.

Central and S. America ***lelaps*-group** (p. 263)

- Mesoscutum dull, coarsely rugose-punctate or simply closely punctate with dull microsculpture ; head above with some sort of rugosity.

Disc of the scutellum always as strongly sculptured as the mesoscutum ; areolet very small, slit-like, the 2nd transverse cubitus received onto the 1st at middle or proximal to middle. Old World, especially tropical Africa

***fasciipennis*-group** (p. 244)

- 13 1st abscissa of the discoideus distinctly shorter than the 2nd 14
- 1st abscissa of the discoideus about as long as the 2nd 17
- 14 Mesoscutum polished, impunctate.

Tergite 1 short, triangularly dilated, hardly wider than long (Text-fig. 327) ; tergite 3 polished, separated from 2 by a deep groove that is margined along posterior edge of tergite 2 ; palpi long, the 3rd segment of the maxillary palpus being about three quarters as long as the 1st segment of the flagellum. Japan

***coenonymphae*-group** (p. 258)

- Mesoscutum rugose, rugose-punctate or punctate with dull microsculpture 15
- 15 Almost basal half of stigma orange-yellow ; fore wing marked with hyaline and brown patches ; both tergite 2 and 3, that is, the whole of tergite (2 + 3), very coarsely striate-rugose.

Head above polished ; ocelli in a low, very wide triangle, the transverse, posterior tangent to the anterior ocellus just cutting the posterior pair. Europe

***abdominalis*-group** (p. 254)

- Stigma brown ; fore wing not maculated ; tergite 3 at most with feeble traces of sculpture and in strong contrast with a strongly sculptured 2nd tergite ; ocelli in a higher triangle, this tangent at most nearly touching the posterior pair 16
- 16 Tergite 2 much shorter than 3 (Text-fig. 328) ; thorax entirely black ; mesoscutum strongly, coarsely punctate ; 1st abscissa of the radius very obliquely placed on the stigma (Text-fig. 312).

Vertex smooth, polished ; vannal lobe fringed with long hairs throughout. Old World ***connexus*-group** (p. 248)

- Tergite 2 fully as long as 3 ; thorax red, except for the propodeal region ; mesoscutum finely rugose and only indistinctly punctate ; 1st abscissa of the radius placed more nearly at right angles on the stigma. Europe

***alvearius*-group** (p. 248)

- 17 Posterior, polished band of the scutellum hardly interrupted at middle ; mesoscutum with an extremely fine, virtually irresolvable sculpture ; tergite 2 strongly transverse, much shorter than 3, divided into three fields of which the lateral fields are very distinctly transverse.

Propodeum in large part polished. Europe ***orontes*-group** (p. 254)

- Posterior, polished band of the scutellum widely interrupted at middle ; mesoscutum strongly sculptured, with some sort of punctation, usually coarser along the course of the notaulices ; the surface of the mesoscutum tends to be dull because of a fine

scaly-reticulation between the punctures (except in *meges*) ; tergite 2 not obviously transverse and not shorter than 3 ; if it shows division into three fields, then the lateral fields are not transverse.

- Tergite 3 always rugose over at least most of its surface. Europe. N. America
***scotica*-group** (p. 251)
- 18 Metacarp short, at most twice as long as its distance from the apex of the radial cell.
Tergite 1 parallel-sided or narrowed behind 19
- Metacarp longer, at least twice as long as its distance from the apex of the radial cell 20
- 19 Inner spur of the hind tibia short, hardly reaching beyond the middle of the hind basitarsus ; tergite 2 usually with a triangularly widened, median field ; surface on each side of this field more weakly sclerotised, even thin, membranous and smooth ; areolet reduced to the size of a hyaline point (Text-fig. 306) ; disc of scutellum dull, densely rugose or rugose-punctate and sharply separated from the posterior, polished band of the scutellum.
Propodeum usually without a medial keel ; stigma tending to be short, broad.
Africa ***lepelleyi*-group** (p. 258)
- Inner spur of the hind tibia reaching considerably beyond the middle of the hind basitarsus ; tergite 2 showing as a large, coarsely rugose segment (vermiculately-rugose), sometimes with poorly defined median field that is widest in front ; areolet rather large (Text-fig. 302) ; disc of scutellum shiny and with only weakly indicated sculpture ; hence, hardly separated from the posterior, polished band of the scutellum.
Propodeum with weak, medial keel. Europe ***alvearius*-group** (p. 248)
- 20 Propodeum with medial keel (hardly indicated in the N. Guinea group of *euterpe*) 21
- Propodeum without a medial keel.
Disc of the scutellum shiny and at most weakly punctate ; 1st abscissa of the discoideus much shorter than the 2nd ; 2nd transverse cubitus united with the 2nd abscissa of the radius 23
- 21 Tergite 1 long, narrow, nearly four times as long as wide. Neotropical region
***lelaps*-group** (p. 263)
- Tergite 1 at most about one and one third times longer than wide, widened behind.
Tergite 2 divided into three fields of which the median is widest in front 22
- 22 Antenna very short, segments 10–12 being hardly longer than wide ; tergite 1 not longer than wide and much widened behind ; propodeum with some sort of sculpture, usually punctation. Old World ***spretus*-group** (p. 255)
- Antenna normal, long, the preapical segment fully two and a half times longer than wide ; tergite 1 about one and one third times longer than wide, slightly widened behind ; propodeum polished and with faintly indicated, medial keel.
N. Guinea ***euterpe*-group** (p. 250)
- 23 Inner spur of the hind tibia much longer than the outer one and reaching well beyond the middle of the hind basitarsus ; 1st abscissa of the radius much longer than the 2nd, fully three times as long (Text-fig. 317) ; tergite 1 almost parallel-sided ; tergite 2 with an elongate median field that is not triangularly widened behind.
Europe ***calceatus*-group** (p. 256)
- Inner spur of the hind tibia hardly longer than the outer one and hardly reaching beyond the middle of the hind basitarsus ; 1st abscissa of the radius about one and a half times longer than the 2nd (Text-fig. 304) ; tergite 1 strongly narrowed behind, wedge-shaped ; tergite 2 with strongly triangular median field. Australia
***regularis*-group** (p. 235)

THE *REALES*-GROUP

Monobasic.

Protomicroplitis reales sp. n.

♀. A species of slender, delicate build. Body reddish-brown ; mesoscutum with three faintly darker bands. Legs uniformly brown, the hind pair a little darker than the other two pairs. Wings markedly smoky.

Head, from above, approaching a subcubical condition, not in the least scooped out behind the ocelli. Clypeus somewhat high and swollen. Frons and vertex virtually without sculpture.

Mesoscutum finely punctate-rugose. Propodeum rather long and with well defined medial keel. Areolet more or less 4-sided, the 2nd transverse cubitus reduced to a transparent point and received onto the radius (Text-fig. 298) ; radiellian cell of the hind wing twice as long as high and much narrowed distally ; vannal lobe with long fringe (Text-fig. 300). Legs very long, slender ; front femur, seen from side, six times as long as wide ; hind tibia seen from outer side constricted distal to middle and with only fine, rather sparse spines.

Tergite 1 fully two and a half times as long as its middle width and with medial furrow over basal two thirds ; tergite 2 with delicate aciculation almost all over and with a feebly indicated, elongate, median field ; tergite 3 at least medially with indication of sculpture similar to that of 2. Ovipositor sheath without modified apical setae.

S. AFRICA : Cape Province, Pondoland, Port St. John, 10-31.vii.1923, 1 ♀, the TYPE, (R. E. Turner).

Type in the British Museum (Nat. Hist.).

On the shortness of the hind tibial spurs, this species lacks one of the main features of *Protomicroplitis*. In habitus, it shows a resemblance to *marginatus* but there are many differences, and I do not think there is any real affinity here. *P. reales* seems to be quite isolated and I have met with no species with which it could be confused.

THE *MARGINATUS*-GROUP

Monobasic.

Protomicroplitis marginatus (Nees) comb. n.

Microgaster marginatus Nees, 1834 : 169.

♀. Legs, on the whole, brightly yellowish ; hind coxa blackish ; hind femur yellow but darkened on about apical quarter ; hind tibia infusate on apical third and also on short, basal constricted portion ; hind tarsus infusate throughout. Tergite (2 + 3) yellow on each side of the narrow median field ; the apical part of this sclerite also pale towards sides. Flagellum yellowish except towards apex.

Head from above somewhat quadrate. Disc of scutellum domed, closely punctate but posteriorly becoming densely rugose and completely interrupting the posterior, polished band of the scutellum. Propodeum long, flattened, with rather weak medial keel. 1st abscissa of the discoideus much shorter than the 2nd. (Text-fig. 322) ; vannal lobe with fringe of long hairs throughout (Text-fig. 6). Hind tibia a little swollen medially ; spines of the outer side of the hind tibia fine and rather sparse ; front tarsal segment 5 with minute spine, very hard to see.

Ovipositor sheath without trace of apical setiform hairs.

EUROPE.

Type presumably lost.

I have examined some specimens from the Philippines, Baguio, Benguet, 1 ♀, Dapitan, 1 ♀, 3 ♂♂, that are almost indistinguishable from European examples.

The females have the antenna evenly brownish, with the propodeum, tergite 1 and the median field of tergite (2 + 3) slightly more strongly rugose. I am provisionally labelling these specimens as "*marginatus* Ns" with a query.

Host: Bred in Germany by R. Hinz from *Larentia pomoriana* Eversmann (Geometridae), 1 ♂.

This is a slender, long-legged species with the habitus of the *vitripennis*-group of *Apanteles*. It is somewhat isolated but perhaps related to the *calceatus*-group from which it differs at once in having the posterior, polished band of the scutellum interrupted at middle and the propodeum with a keel.

THE *PERIANDER*-GROUP

Monobasic.

Protomicroplitis periander sp. n.

This is a most distinctive species, without close allies.

♀. Yellowish brown; the head paler than the mesoscutum and the thorax paler beneath. Legs, including the hind coxa, yellowish throughout. Wings strongly but rather unevenly brownish.

Occiput not scooped out behind the ocelli. Ocelli in a high triangle, the posterior, transverse tangent to the anterior ocellus passing far in front of the posterior pair. Antenna a little shorter than the body, slightly tapered apically and with the preapical segment about one and a half times longer than wide.

Mesoscutum dull, strongly, more or less confluent, punctate. Veins of the fore wing somewhat thickened (Text-fig. 294); cubitellian cell of the hind wing very small; vannal lobe beyond its widest part with sparse, minute, projecting hairs. Hind coxa rather small, not reaching the middle of the gaster.

Tergite 1 about one and a half times longer than wide, grooved medially; its sides gently rounded at apex; smooth, except for rugosity at posterior corners. Tergite (2 + 3) with a median field that is widened anteriorly. Hypopygium very characteristically clothed with long silky hairs.

Length: ca. 2.8 mm.

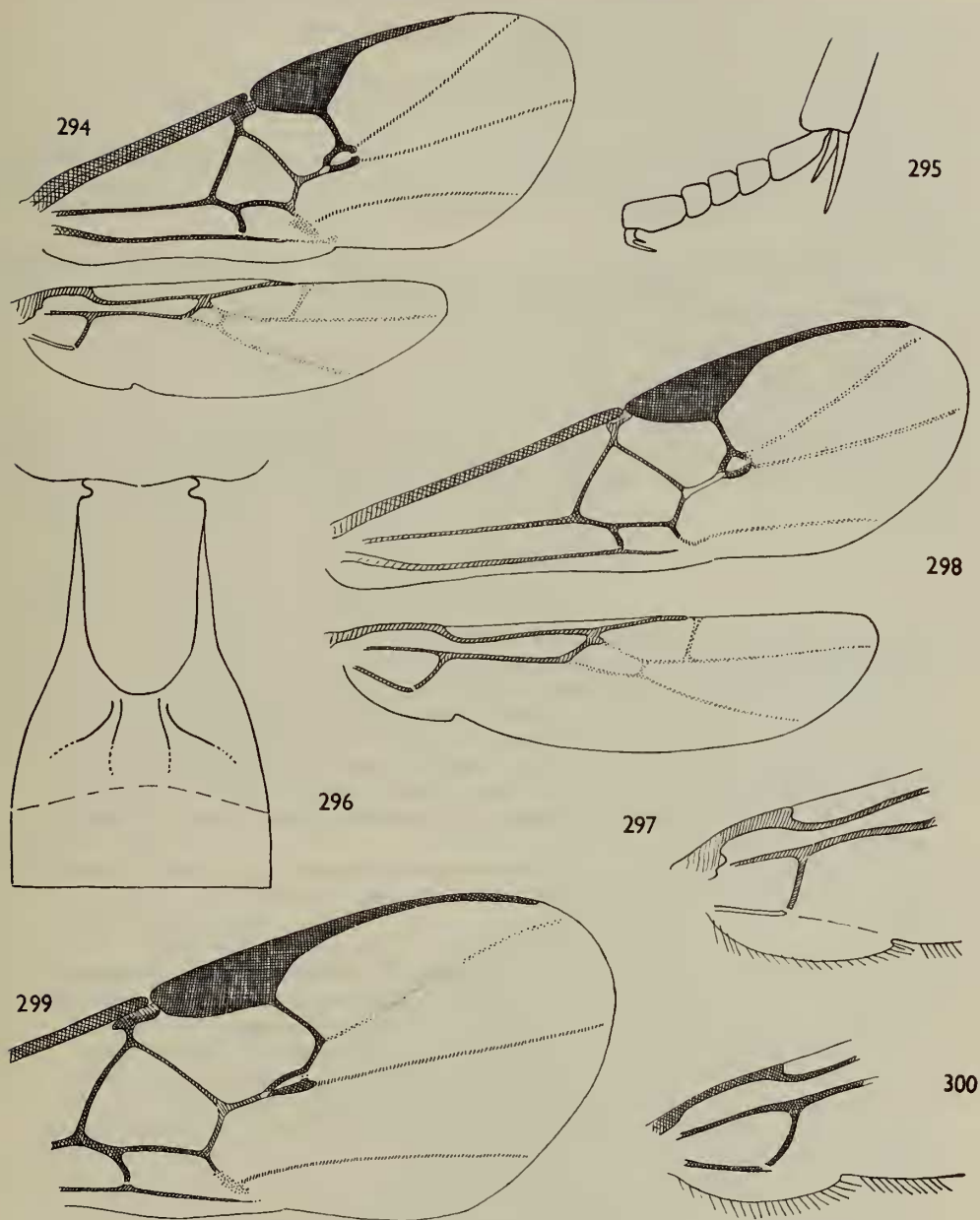
PHILIPPINES: Los Baños, 5 ♀♀, one the *TYPE*, 3 ♂♂, bred 23.iii.1923, (G. B. Ingalla). This is presumably a gregarious parasite though the host is not given.

Type in the U.S. National Museum.

This species is easily recognisable on the combination of characters given in the key. Within the material I have had before me it is aberrant but its affinities are clearly with the large assemblage of species that I associate with the *xanthaspis*-group.

THE *XANTHASPIS*-GROUP

Contains the vast majority of the species that fall within my interpretation of *Protomicroplitis* and is little more than an artificial segregation within a large complex of species that contain also the groups of *basimacula* and *fasciipennis*. The two last mentioned groups stand at opposite extremes with regard to the sculptural modifications shown by the sclerite I call tergite (2 + 3). The group of *xanthaspis* falls somewhere in between.



FIGS. 294-300. *Protomicroplitis*, ♀: 294, *periander* sp. n., wings; 295, same, middle tarsus; 296, *lepellei* (Wilkinson), basal tergites; 297, *periander* sp. n., hind wing, part; 298, *reales* sp. n., wings; 299, *euterpe* sp. n., fore wing, part; 300, *reales* sp. n., hind wing, part.

***Protomicroplitis xanthaspis* (Ashmead) comb. n.**

Apanteles xanthaspis Ashmead, 1900 : 280.

Microgaster xanthaspis (Ashmead) Muesebeck, 1920 : 28.

♀. Hind femur blackish. Tergite 1 yellow ; rest of body blackish.

Face coarsely rugose-punctate. Occiput scooped out as far as the posterior ocelli. Vertex and temples coarsely punctate.

Mesoscutum dull, closely rugose-punctate all over. Disc of scutellum as dull and rugose as the mesoscutum. Propodeum coarsely rugose and with well defined medial keel. Areolet 3-sided ; 1st abscissa of the discoideus as long as the 2nd ; vannal lobe with distinct fringe of hairs throughout.

Tergite 1 narrow, parallel-sided, about twice as long as wide and with complete longitudinal groove. Tergite (2 + 3) with distinct but rather poorly defined median field that is slightly wider in front than behind. Ovipositor sheath without apical setiform appendages.

W. INDIES : St. Vincent. (Type locality).

Type in the British Museum (Nat. Hist.).

The following key introduces as new certain Philippine species and one from Borneo that I have been able to separate from the other species of the group known to me. How they stand in relation to these other species will be made clear in the key itself.

KEY TO PHILIPPINE SPECIES

FEMALES AND MALES

- 1 Lateral sulci of tergite 2 strongly developed and each in the form of a deeply channelled groove that borders the edge of the tergite at least as far as the 2nd suture.
Tergite 2 distinctly a little longer than 3, strongly modified, showing a narrow, parallel-sided median field that is separated from the lateral surface of the tergite by a broad, rugose furrow (Text-fig. 307) ; 2nd suture deep, strongly costate ; eyes normal, slightly divergent above and separated from the posterior ocellus by a distance distinctly greater than the longer diameter of the ocellus ; head red. (*pyrene*-sub-group, transitional between *basimacula*-group and typical *xanthaspis*-group) 2
- Lateral sulci of tergite 2 not thus strongly developed ; if marked at all, each extends only as far as the edge of the tergite and then fades out 5
- 2 Females 3
- Males 4
- 3 Front and middle claws with a comb of fine, very close bristles ; mesoscutum and scutellum red ; hind femur infuscate at apex ; hind tibia blackened at extreme base and on apical third ; hind coxa with a conspicuous black apical patch ; median field of tergite 2 long, better defined ; the lateral areas of this tergite highly polished.
Mesoscutum strongly shining, without surface sculpture, its sharp punctures at least mid-posteriorly often separated by nearly one diameter ; tergite 1 at apex with a deep, smooth pit, the sub-horizontal surface on each side of which is swollen and smooth ; 2nd transverse cubitus meeting the 1st transverse cubitus far from junction of the two radial abscissae (Text-fig. 310) ***pyrene* sp. n.**
PHILIPPINES: Luzon, Mt. Makiling, 1 ♀, the TYPE, 8 ♂♂, (*Baker*) ; Los Baños, 1 ♀, (*Baker*). Type in the U.S. National Museum.
The flagellum is long, thick, with the preapical segment fully twice as long as wide.
- Front and middle claws simple ; mesoscutum blackened but with reddish suffusion posteriorly ; scutellum reddish ; hind femur entirely pale ; hind tibia with very faint apical infuscation ; hind coxa with slight infuscation at apex above ; median field

of tergite 2 less well defined ; lateral areas with faintly indicated surface sculpture.

Tergite 1 at apex with deep excavation but not smoothly hollowed out ; surface on each side of excavation less swollen, coarsely rugose ; areolet as in *pyrene* (cf. Text-fig. 310) *seriphus* sp. n.

PHILIPPINES: Los Baños, 1 ♀, the TYPE, 1 ♂, Luzon, Mt. Makiling, 1 ♂, (all *Baker*). Type in the U.S. National Museum.

- 4 Tergite 3 only slightly wider apically than its median length, hence only slightly transverse ; the three delimited fields of tergite 2 slightly longer and highly polished.

Mesoscutum varying from red through dusky red to almost black ; claws without a comb *pyrene* sp. n.

- Tergite 3 much wider than medially long, nearly twice as wide ; the three fields of tergite 2 shorter and with clear indication of surface sculpture,

Mesoscutum bright reddish ; the thorax is almost entirely reddish above, the pale colour extending backwards as far as the anterior surface of the propodeum ; tergite 1 and most of 3 reddish (see couplet 3) *seriphus* sp. n.

A single male that I also refer to this species (Mt. Makiling) differs from the typical form in having the entire thorax and the dorsal surface of the gaster blackish, with the mesoscutum more shiny and less obviously punctate posteriorly.

- 5 Eyes very large, slightly convergent above, separated from the posterior ocellus by a distance not greater than the diameter of the ocellus.

Tergite 1 only about one and half times to one and two thirds times as long as its middle width ; tergite 2 sharply divided into three areas by deep furrows ; ovipositor with a pale, apical setiform appendage 6

Eyes not as large as this, slightly divergent above and separated from the posterior ocellus by a distance very distinctly greater than the diameter of the ocellus.

African and S. American spp.

- 6 First abscissa of the radius very long, meeting the 2nd transverse cubitus (itself a mere hyaline spot) at the junction of the 2nd abscissa of the radius.

Thorax almost black ; hind coxa reddish-yellow ; face reddish with fairly strong rugose-punctuation along each side *urios* sp. n.

BORNEO: Sandakan, 1 ♀, the TYPE, (*Baker*). Type in the U.S. National Museum.

Easily distinguished from the next two species by the long 1st abscissa of the radius.

- First abscissa of the radius much shorter, not uniting with the 2nd transverse cubitus ; 2nd transverse cubitus meeting the 1st far proximal to the junction of the two abscissae of the radius 7

- 7 Hind coxa bright yellow ; mesoscutum yellow with faint infusate spot at shoulder ; 2nd transverse cubitus virtually not indicated, hence no areolet ; 1st transverse cubitus curiously thickened (Text-fig. 308).

The narrow, yellow face shows only a very superficial sculpture . . . *melleus* sp. n.

PHILIPPINES: Luzon, Mt. Makiling, 2 ♀♀, one the TYPE, (*Baker*).

Type in U.S. National Museum.

A male from Los Baños has the mesoscutum reddened, with the lateral lobes faintly darker and the hind coxa not such a bright yellow ; the venation is like that of the female.

- Hind coxa deeper in colour, reddish-yellow ; mesoscutum entirely infusate, though becoming paler posteriorly ; 2nd transverse cubitus distinct, the areolet hence clearly indicated ; 1st transverse cubitus not thickened.

Face reddish, slightly less narrow than in *melleus* and its surface more shiny and smoother *medon* sp. n.

PHILIPPINES: I. of Basilan, 1 ♀, the TYPE, 1 ♂, (*Baker*). Type in the U.S. National Museum.

THE *FASCIIPENNIS*-GROUP*Protomicroplitis fasciipennis* (Gahan) **comb. n.**

Microgaster fasciipennis Gahan, 1918 : 587.

Microgaster fasciipennis Gahan ; Wilkinson, 1929 : 116.

Microgaster fasciipennis Gahan ; de Saeger, 1944 : 77.

The type locality of this species is UGANDA, Kampala, and the type is in the U.S. National Museum.

De Saeger used the name of this species to designate a subgroup of *Microgaster*, giving it a definition that corresponds almost exactly to my own definition of what I now refer to as the *fasciipennis*-group.

The group differs from the *xanthaspis*-group only in that tergite (2 + 3) shows no delimited median field. De Saeger has described several species in this group ; I hope to deal with these and others, which may be different from them, at a later date.

THE *BASIMACULA*-GROUP

The species of this group represent only an extreme development of the form of the first two gastral tergites. Apart from this, they show no character or combination of characters that would exclude them from a close relationship with the groups of *xanthaspis* and *fasciipennis*.

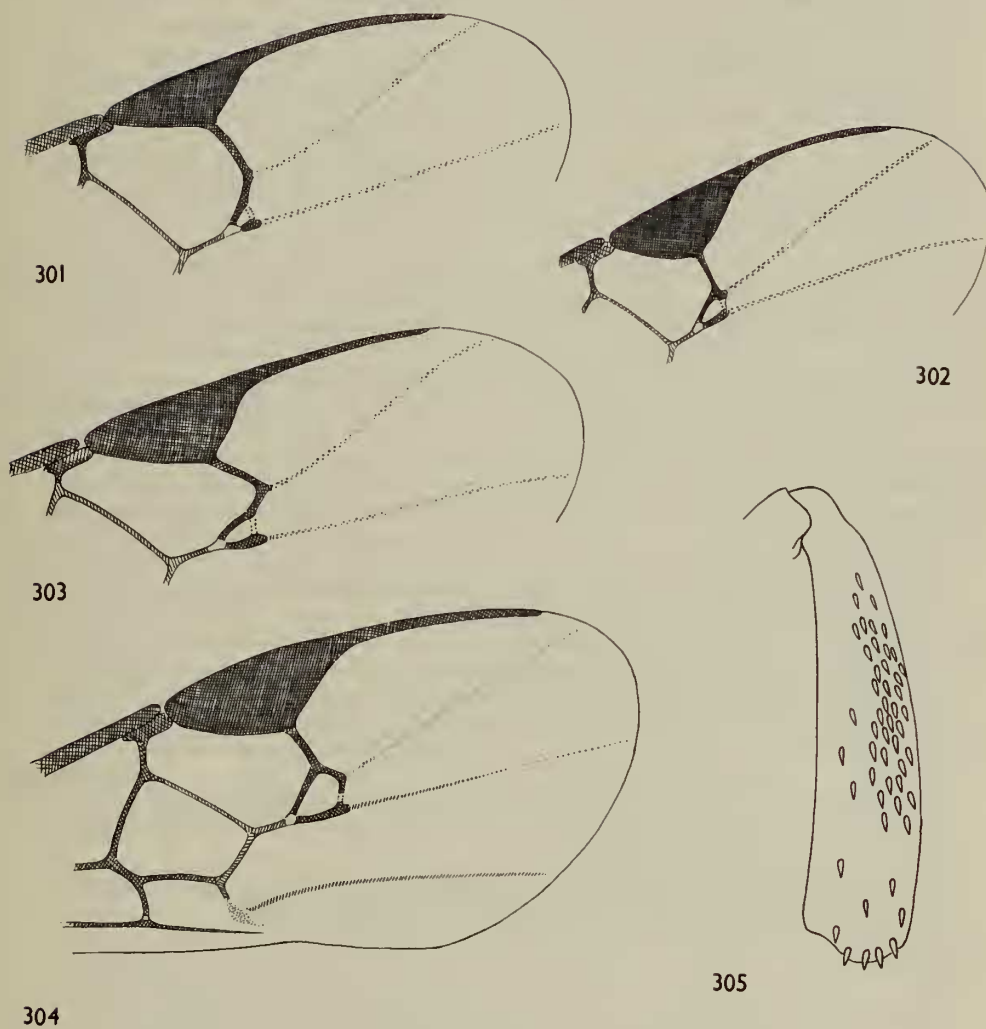
De Saeger, who studied the species from the Belgian Congo, described a few that are at present unknown to me. In the following key I am setting forth all that I have found to be useful in separating the species available to me for study in the British Museum.

KEY TO SPECIES

FEMALES AND MALES

- | | | |
|---|---|---|
| 1 | Tergite 3 with a median, in greater part polished area or, polished and unsculptured over most of its apical half ; the elongate median area of tergite 2 in greater part shining, smooth ; ocelli in a very low triangle, the transverse, posterior tangent to the anterior ocellus cutting deeply into the paired ocelli. Old World species | 2 |
| — | Tergite 3 without a median area or, if there is an indication of one, then it bears fine surface sculpture ; ocelli in a higher triangle, the transverse posterior tangent to the median ocellus only just touching the posterior pair. | |
| | Edge of vannal lobe beyond its widest part straight or appearing even slightly concave and here without projecting hairs ; propodeum more convex than in the Old World species, the medial keel less emphasised and the whole propodeal surface densely reticulate. New World species | 8 |
| 2 | Females | 3 |
| — | Males | 5 |
| 3 | Tergite 3 smooth, polished mid-basally and almost as smooth over most of apical half ; hind femur yellow and darkened only on apical third. | |

Hairs of the fore wing longer, darker and sparser than in *basimacula* ; mesopleurum with rather fine rugose-striation that is concentric around the middle, polished area ; vannal lobe with hair-fringe throughout ; tergite 1 less widened to



FIGS. 301-305. *Protomicroplitis*: 301, *eclectes* sp. n., ♂, fore wing, part; 302, *alvearius* (Fab.), ♀, fore wing, part; 303, *basimacula* (Cameron), ♂, fore wing, part; 304, *tegularis* (Szepligeti), ♀, fore wing, part; 305, *circumvectus* (Lyle), ♀, hind tibia.

apex than in *basimacula*, its middle furrow shallower and the surface on each side of it less convex ; tergite 3 distinctly shorter than 2 ; ovipositor sheath at apex with a thickened, non-spatulate hair *glaphyra* de Saeger¹⁶

BELGIAN CONGO: Rweru (type locality), described from a single female. Type in Congo Museum, Tervuren. ABYSSINIA: 1 ♀, in B.M. (N. H.).

- Tergite 3, except for a median, polished area, sculptured right to apex ; hind femur, except for a small, pale spot at base beneath, black or blackish throughout.

Fore wing with conspicuous apical spot ; tergite 1 more widened apically than in *glaphyra* and because of a deeper, medial furrow, appearing more convex on each side 4

- 4 First abscissa of the radius and the 1st transverse cubitus forming a right angle or even a slightly acute angle (Text-fig. 303) ; surface on each side of the medial propodeal keel densely rugose-punctate ; polished, median area of tergite 3 virtually parallel-sided.

Hind tibia usually with short, pale, basal ring, separated from dark base by about its own length ; sometimes (Katberg, 1 ♀) the pale area covers almost half of the hind tibia ; edge of vannal lobe beyond its widest part straight and fringed with hairs (Text-fig. 7) ; outer surface of the hind coxa confluent rugose-punctate ; modified seta at apex of ovipositor sheath shorter than in the next species

basimacula (Cameron)¹⁷

S. AFRICA: numerous examples. BELGIAN CONGO: Recorded by de Saeger. Type in the British Museum (Nat. Hist.).

- First abscissa of the radius and the 1st transverse cubitus forming an obtuse angle (Text-fig. 301) ; surface on each side of the propodeal keel smooth-looking, its sculpture reduced to coarse, obsolescent punctation ; polished, medial area of tergite 3 subtriangular, widened in front, the sculpture on each side of it more smoothly striate than in *basimacula* ; edge of vannal lobe beyond its widest part very slightly concave and here without trace of a fringe of hairs.

Flagellum more slender in apical half than in *basimacula* and the segments here less smooth-looking ; outer surface of the hind coxa with reduced sculpture, the surface showing sharp, mostly discrete punctures of various sizes ; modified seta at apex of ovipositor sheath long, spatulate, upcurved ; hind tibia yellowish on about basal half but dark at extreme base, not different from the palest forms of *basimacula* *eclectes* sp. n.

PHILIPPINES: Luzon, Mt. Makiling, 1 ♀, the TYPE, 1 ♂, var. Mindanao, Davao, 1 ♂. MALAYA: I. of Penang, 1 ♂, Singapore, 1 ♂. BORNEO, Sandakan, 1 ♂. (All Baker). Type in the U.S. National Museum.

- 5 Hind coxa strikingly bicoloured, being predominantly reddish-yellow with an elongate dorsal infuscation extending the whole length of the coxa.

Stigma narrow, emitting radius very distinctly beyond middle ; fore wing without trace of an apical spot ; gaster narrow, its dorsal surface entirely dark brown, though tergite 1 at base shows a faint reddish suffusion ; surface on each side of propodeal keel smooth-looking and with only scattered, vaguely delimited punctures ; 1st transverse cubitus meeting 1st abscissa of radius at an obtuse angle (cf. *basimacula*) ; vannal lobe throughout with hair-fringe *integra* (Wilkinson)⁴⁸

AFRICA: Uganda. TYPE ♂ only. Type in the British Museum (Nat. Hist.).

- Hind coxa entirely black 6

¹⁶*Microgaster glaphyra* de Saeger, 1944 : 81.

Protomicroplitis glaphyra (de Saeger) **comb. n.**

¹⁷*Apanteles basimacula* Cameron, 1904 : 173.

Microgaster basimacula (Cameron) Wilkinson, 1929 : 101.

Protomicroplitis basimacula (Cameron) **comb. n.**

⁴⁸*Microgaster integra* Wilkinson, 1929 : 103.

Protomicroplitis integra (Wilkinson), **comb. n.**

- 6 Edge of vannal lobe beyond its widest part with fringe of hairs ; 1st abscissa of the radius meeting the 1st transverse cubitus at a right angle or even a distinctly acute angle ; propodeum on each side of its keel densely rugose-punctate.
Tergite 1 and 2 yellow ; hind femur virtually black throughout ; fore wing with or without a faint apical spot, less distinct than the female . *basimacula* (Cameron)
- Edge of vannal lobe beyond its widest part without a fringe of hairs and here very slightly concave ; 1st abscissa of the radius forming a curve at its junction with the 1st transverse cubitus or, if the two veins are distinctly angled at their junction, then the angle is obviously obtuse ; propodeum on each side of its keel smooth-looking and with only vague punctation or rugose-punctuation.
Fore wing with an apical spot 7
- 7 2nd discoidal cell almost without hairs ; tergite 1 more narrowed to apex, reddish, with the posterior, horizontal surface on each side of the furrow blackened ; tergite 3 with a large, sub-triangular polished area, widest on anterior side and extending over about two thirds of the middle length of the tergite.
Hind femur red with weak apical infuscation *sons* (Wilkinson)⁴⁹
AUSTRALIA: F. C. T., Brindabella, *TYPE* ♂ only. Type in British Museum (Nat. Hist.).
- 2nd discoidal cell hairy almost everywhere ; tergite less narrowed to apex, yellow throughout ; tergite 3 with narrow, longitudinal, polished area extending virtually to apex.
Hind femur reddish brown. A single ♂ from Mt. Makiling has the hind femur blackish and tergite 1 almost entirely blackish, showing only a faint reddish flush along each side (see couplet 4) *eclectes* sp. n.
- 8 Females 9
– Males.
Gaster entirely black ; hind femur varying from entirely reddish-yellow to reddish-yellow basally with infuscation spreading over as much as apical half (see couplet 9) *nephele* sp. n.
- 9 Tergites 1 and 2 entirely black or at most tergite 1 with paler, lateral area ; tergite 2 without indication of a median field.
Spp. with hind femur almost entirely black ; hind tibia sharply whitish on about basal third 10
- Tergites 1 and 2 yellow-testaceous except for the median field of tergite 2 ; tergite 3 with indication of an elongate wedge-shaped area with sculpture similar to that of the median area of 2.
Paler species than those following, with the hind femur suffused with reddish on fully basal third and the dark apical part of the hind tibia brown rather than black ; flagellum distinctly thickened and darkened in apical third ; head brown ; length 2.4 mm. *nephele* sp. n.
BRAZIL: Nova Teutonia, 15.vi.1937, 1 ♀, the *TYPE*, v-vi, 6 ♂♂, (*Plaumann*). Type in the British Museum (Nat. Hist.).
- 10 Head, in a facial view, almost subtriangular ; face somewhat flattened, almost smooth, unsculptured, its pubescence long, pale, silky ; head, from above, more transverse ; propodeum with more even reticulation, without trace of a dull bloom and more convex ; median field of tergite 2 with vague but coarse rugose-punctuation ; larger, ca. 3.5 mm. *alce* sp. n.
BRAZIL: Nova Teutonia, 11.x.1937, 1 ♀, the *TYPE*, (*Plaumann*). Type in the British Museum (Nat. Hist.).
This species has tergite 3 more convex than the next species and much more convex than in any of the Old World species, (but cf. African genus *Buluksa* de Saeger) ;

⁴⁹*Microgaster sons* Wilkinson, 1932 : 87.*Protomicroplitis sons* (Wilkinson) **comb. n.**

the fore wing proximal to the areolet is remarkably free from hairs, there being only about 12-15 within the 1st discoidal cell.

- Head, in a facial view, not in the least subtriangular ; face not flattened, shiny and covered with raised points ; pubescence of face and head normal ; from above, the head by no means especially transverse ; propodeum with more irregular, wider-meshed reticulation and with trace of a dull bloom ; fore wing not thus free from hairs ; 1st discoidal cell thickly hairy all over ; smaller, ca. 2.5 mm.

Flagellum almost yellow on proximal two thirds, clearly thickened towards apex but less abruptly so than in *nephele* ; the antennae are broken in *alce* but the remaining segments suggests an antenna that is longer, darker, and less thickened apically than in the present species **erro** sp. n.

BRAZIL: Nova Teutonia, 4.vi.1937, 1 ♀, the TYPE, (*Plaumann*). Type in the British Museum (Nat. Hist.).

THE CONNEXUS-GROUP

The two species I include in this group are very closely and naturally related in spite of their curious range.

The group is easily recognised on its combination of very short 1st abscissa of the discoideus and short, strongly sculptured 2nd tergite. The ocelli are in rather a high triangle, the posterior, transverse tangent to the anterior ocellus passing far in front of the posterior pair.

KEY TO SPECIES

- A Tergite 3 highly polished, impunctate ; setae of gaster very sparse, almost absent on tergite 3 ; rugose area of tergite 2 more narrowed laterally ; tergite 1 narrower ; flagellum not at all thickened distally and with the preapical segment about two and a half times longer than wide **perniciosa** (Wilkinson)⁵⁰

AUSTRALIA: Victoria (Type locality). Type in the British Museum (Nat. Hist.).

Host: *Ardices glatignyi* Le Guillemot (Arctiidae). Cocoons buff-coloured ; three of the four cocoons mounted with the type material are spun together so the species is evidently gregarious.

- B Tergite 3 with traces of rugosity and a few shallow, scattered pits (Text-fig. 328) ; setae of the gaster dense, especially on tergite 3 ; rugose area of tergite 2 less narrowed laterally ; tergite 1 wider ; flagellum distally thickened, the preapical segment about twice as long as wide **connexus** (Nees)⁵¹

EUROPE. Type presumably lost.

Host: *Euproctis similis* Fuessly ; *Euproctis chrysorrhoea* Hübner ; *Porthesia auriflua* F. (all Lymantriidae).

THE ALVEARIUS-GROUP

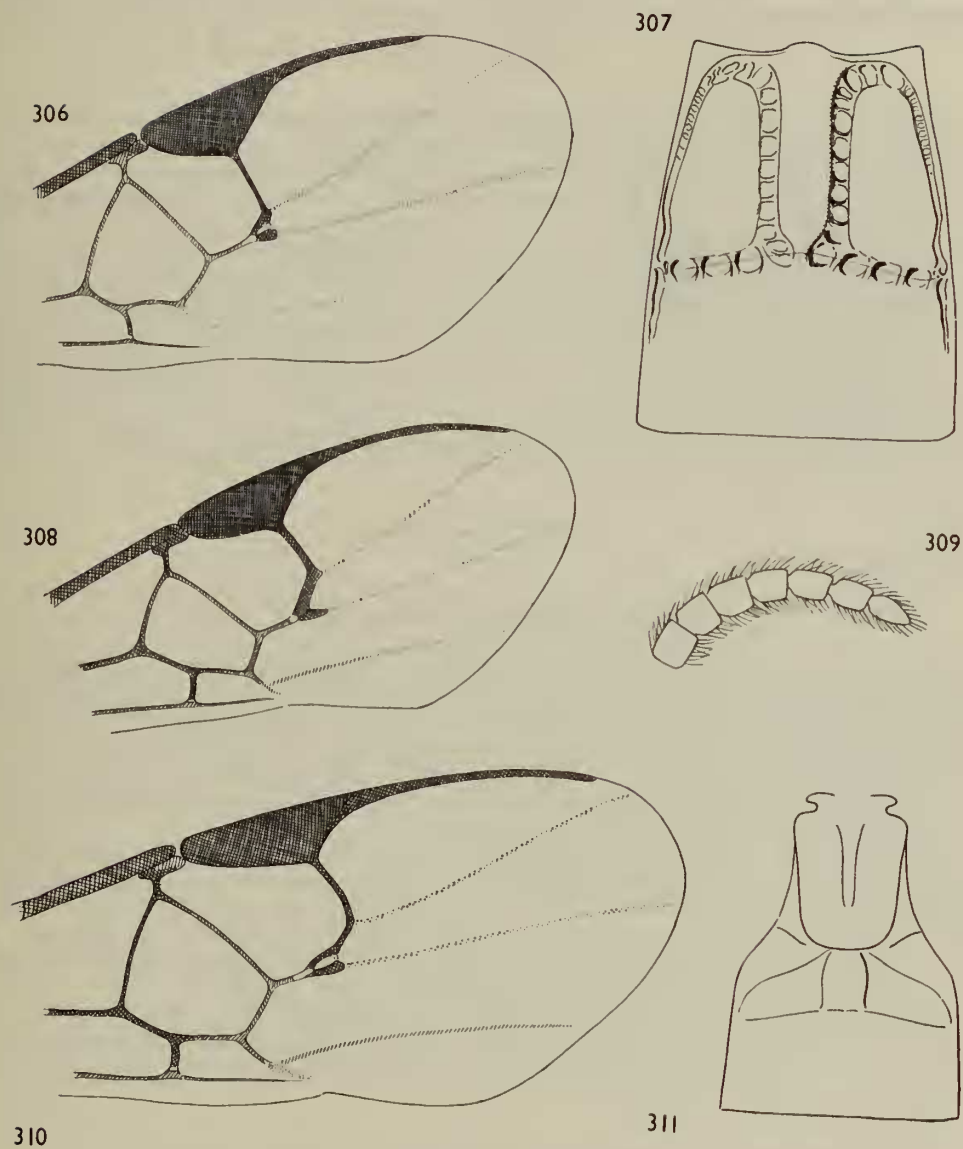
I include in this group two not very closely related species, though very similar in general habitus. Both have tergite 2 strongly rugose and about equal in length to 3 ; tergite 3 sometimes shows a little weak rugosity at base. The strong, often coarse punctation that characterizes most of the species of the *xanthaspis* and *fasciipennis* groups is absent here, the sculpture of the mesoscutum being fine and not easily resolvable. Small species : 2.5-2.8 mm.

⁵⁰*Microgaster perniciosa* Wilkinson, 1929 : 112.

Protomicroplitis perniciosa (Wilkinson) **comb. n.**

⁵¹*Microgaster connexus* Nees, 1834 : 174.

Protomicroplitis connexus (Nees) **comb. n.**



FIGS. 306-311. *Protomicroplitis*, ♀: 306, *lepelleyi* (Wilkinson), fore wing, part; 307, *pyrene* sp. n., tergite (2 + 3); 308, *melleus* sp. n., fore wing, part; 309, *austrina* (Wilkinson), apex of flagellum; 310, *pyrene* sp. n., fore wing, part; 311, *orontes* sp. n., basal tergites.

Both species make an identical and characteristic cocoon mass. The cocoons are stacked, one above the other and each parallel with its neighbour to form a compact, comb-like structure.

KEY TO SPECIES

- A Head, thorax except for the propodeal region, and legs in far greater part, red : metacarp between three and four times as long as its distance from the apex of the radial cell (Text-fig. 302) ; tergite 1 wider ; tergite 2 slightly longer than 3 *alvearius* (F.)⁵²

EUROPE.

Host: *Boarmia rhomboidaria* Schiffermüller (Geometridae).

- B Entire body virtually black ; metacarp at most a little longer than its distance from the apex of the radial cell ; tergite 1 narrower ; tergite 2 not at all longer than 3, sometimes with weakly indicated median field that is widest in front.
Mesoscutum shiny, with an uneven, weak, somewhat granular sculpture, more in evidence behind and along imaginary course of the notaulices . *minuta* (Reinhard)⁵³

EUROPE.

Host: *Cleora jubata* Thunberg (formerly *glabraria* Hübner) (Geometridae).

THE EUTERPE-GROUP

Monobasic.

Protomicroplitis euterpe sp. n.

♀. Head and gaster entirely bright reddish-yellow. Thorax black except for the propodeum, which is yellowish and the pronotum and propleurum, which are as yellow as the head. Legs, except for the blackened apical half of the hind tarsus, entirely reddish-yellow. Wings very dark blackish to the naked eye. Scape and pedicel reddish-yellow ; flagellum black.

Head polished, unsculptured. Ocelli in a very low triangle, the posterior transverse tangent to the anterior ocellus cutting deeply into the posterior pair. Antenna long, the preapical segment fully two and a half times longer than wide.

Mesoscutum with a little, fine punctation right in front but at first sight appearing highly polished and unsculptured. Areolet of the fore wing narrow, somewhat elongate ; 2nd transverse cubitus united with the 1st at a considerable distance from the junction of the 1st transverse cubitus and the radius (Text-fig. 299) ; 1st abscissa of the discoideus about half as long as the 2nd. Propodeum with a faintly indicated, medial keel. Hind coxa very large, its outer face with well defined, rather sparse punctures ; claws rather long, simple.

Tergite 1 polished but with a few deep foveae across the apical margin ; its medial furrow not very deep. Tergite (2 + 3) polished, unsculptured, divided by deep furrows into four fields (Text-fig. 329). Ovipositor sheath about as long as segment 2 of the hind tarsus, thin and without trace of apical, modified setae.

Length: ca. 4.5 mm.

DUTCH NEW GUINEA : Cyclops Mts., 3,500 ft., iii.1936, 1 ♀, the TYPE, (L. E. Cheesman).

Type in the British Museum (Nat. Hist.).

⁵²*Ichneumon alvearius* Fabricius, 1798 : 232.

Microgaster alvearius (Fabricius) Spinola, 1808 : 149.

Protomicroplitis alvearius (Fabricius) **comb. n.**

⁵³*Microgaster minuta* Reinhard, 1880 : 357.

Protomicroplitis minuta (Reinhard) **comb. n.**

This is a highly aberrant species though related, I think, to the Philippine species of the *xanthaspis*-group that I have keyed on page 242. It departs from the pattern of these species radically in the almost total suppression of sculpture on the thorax. On size and colour alone, it is a striking species.

THE *SCOTICA*-GROUP

Face dull, rugose-punctate. Vertex with obvious but indefinite sculpture. Ocelli in a low triangle, the transverse, posterior tangent to the anterior ocellus slightly cutting the posterior pair. Disc of scutellum strongly, closely punctate. Propodeum rugose all over and with strongly emphasised medial keel. Areolet large, virtually triangular (Text-fig. 314); vannal lobe with distinct hair-fringe throughout. Inner spur of the hind tibia very long, fully three quarters as long as the hind basitarsus. Tergite 1 varying from more or less parallel-sided to triangularly widened behind; strongly rugose and with medial furrow. Ovipositor sheath with or without modified setae at tip.

I know three species from Europe and there are two N. American species in the British Museum. I include these American species in the key in order to show as wide a range of specific differences as possible within the group definition given above.

KEY TO SPECIES

FEMALES

- 1 Mesoscutum strongly shining, very coarsely, confluent punctate, more especially along the course of the notaulices; hind coxa black, very coarsely rugose; costad abscissa of the basalis fully one third as long as the mediad abscissa.

Tergite (2 + 3) sometimes pale apically; wings decidedly smoky; disc of scutellum becoming almost polished medially and here with a few large, well separated punctures; furrow between scutellum and mesoscutum deeper, wider and more strongly costate than in the other species of the group; 1st abscissa of the discoid-eus as long as the 2nd; spines of the outer side of the hind tibia finer and sparser than in the other species, the tibia hence having a much less prickly appearance; tergite 2 coarsely striate-rugose, more than twice as wide as long and with hardly a trace of a discrete medial field; tergite 3, at least over its medial surface, almost as strongly rugose as 2; ovipositor sheath with 3-4 thickened hairs beneath at apex

meges sp. n

SWITZERLAND: Valais, Les Haudères, Alp du Zate, 6-8000 ft., 10-20.vi.1935, 1 ♀, the TYPE, (J. & R. Benson). AUSTRIA: S. Tyrol, Radein, 1 ♀; Loitsch-Krain, 1 ♀. ITALY: Trieste, xii.1902, 1 ♀. Type in the British Museum (Nat. Hist.).

This species is transitional between the groups of *scotica* and *abdominalis*. The shiny, coarsely sculptured mesoscutum, the sparseness of the tibial spines and the form of the setae at the apex of the ovipositor sheath are strongly reminiscent of *abdominalis*.

- Mesoscutum dull by reason of a fine, scaly-reticulate microsculpture between its punctures; hind coxa reddened at least apically, especially beneath; costad abscissa of the basalis short, not more than one quarter as long as the mediad abscissa. *scotica*-group s. str.
- 2 Ovipositor sheath fully three quarters as long as the hind basitarsus; without modified setae at apex.

2

Gaster broad, with tergite 1 markedly widened behind and tergite 2 strongly transverse; ovipositor thin and without trace of an apical constriction (Text-fig. 313); hind coxa reddish on rather less than apical half and with the pale colour

more extensive below ; preapical segment of the antenna twice as long as wide ; hind tibia entirely red *scotica* (Marshall)⁵⁴

EUROPE: British Is. ; Poland ; Sweden. N. AMERICA: 1 ♀ in British Museum (Nat. Hist.) from British Columbia. Type in the British Museum (Nat. Hist.).

This species is stouter than the second European species, *hinzi* and differs from it at once on the characters of the ovipositor sheath.

- Ovipositor sheath not more than two thirds as long as the hind basitarsus and with modified setae at apex 3

- 3 Tergites, except 1 and the median field of 2, yellowish red ; segment 5 of the front tarsus without a spine ; hind coxa reddened virtually throughout ; 1st abscissa of the discoideus distinctly a little shorter than the 2nd ; flagellum thicker, not tapered distally, the preapical segment about two and one third times longer than wide ; tip of ovipositor sheath with two setae that are pale, adpressed and easily overlooked.

Fore wing yellowish with stigma pale and emitting radius more distal to middle than in *facetosa* ; the mesoscutum and disc of scutellum are more coarsely sculptured than in the other species ; median field of tergite 2 sharply emphasised, its lateral, bounding furrows, deep, coarsely rugose *auripes* (Provancher)⁵⁵

N. AMERICA.

Host: *Neleucania albilinea* Hübner (Noctuidae).

The above notes are based on a specimen in the British Museum determined by Gahan.

- Tergites beyond 2 blackish with at most tergites 2 and 3 narrowly along sides and 3 narrowly across apical margin, yellow ; segment 5 of the front tarsus with a lateral spine ; hind coxa with much blackening on basal half and reddish or yellowish apically ; 1st abscissa of the discoideus as long as the 2nd ; flagellum thinner, tapered distally with the preapical segment about three times as long as wide ; tip of ovipositor sheath with 2-3 blackened setae 4

- 4 Tergite 1 narrow, parallel-sided or nearly so (Text-fig. 326) ; tergite 2 only very slightly transverse, about one and a half times as wide as long ; hind femur yellow rather than red, with darkened tip ; metacarp a little longer ; front tarsal segment 5 without an apical constriction, its spine less well developed.

Hind tibia blackened at apex *facetosa* (Weed)⁵⁶

N. AMERICA. My interpretation of this species is based on specimens determined by Muesebeck and kindly presented by him to the British Museum.

- Tergite 1 shorter, less narrow and distinctly widened behind, more coarsely rugose ; tergite 2 a little more transverse ; hind femur red rather than yellow, its tip hardly darkened ; metacarp a little shorter ; front tarsal segment 5 with a strong apical constriction and well developed spine.

Hind coxa more extensively blackened at base than in *facetosa*, the black covering fully basal half ; in *facetosa*, the yellow of the hind coxa, at least laterally, tends to push into the black area as a tongue ; hind tibia reddish throughout ; ovipositor sheath (Text-fig. 318) *hinzi* sp. n.

EUROPE: Finland ; Germany, Harz, 3 ♀♀, one the TYPE, 1 ♂, bred 23.viii.1953, from *Deilinia pusaria*, (R. Hinz). Type in Coll. Hinz.

Host: *Deilinia pusaria* L. (Geometridae).

The fore wing of this species is faintly darkened apically but remains hyaline within the radial cell.

⁵⁴*Microgaster scotica* Marshall, 1885 : 251.

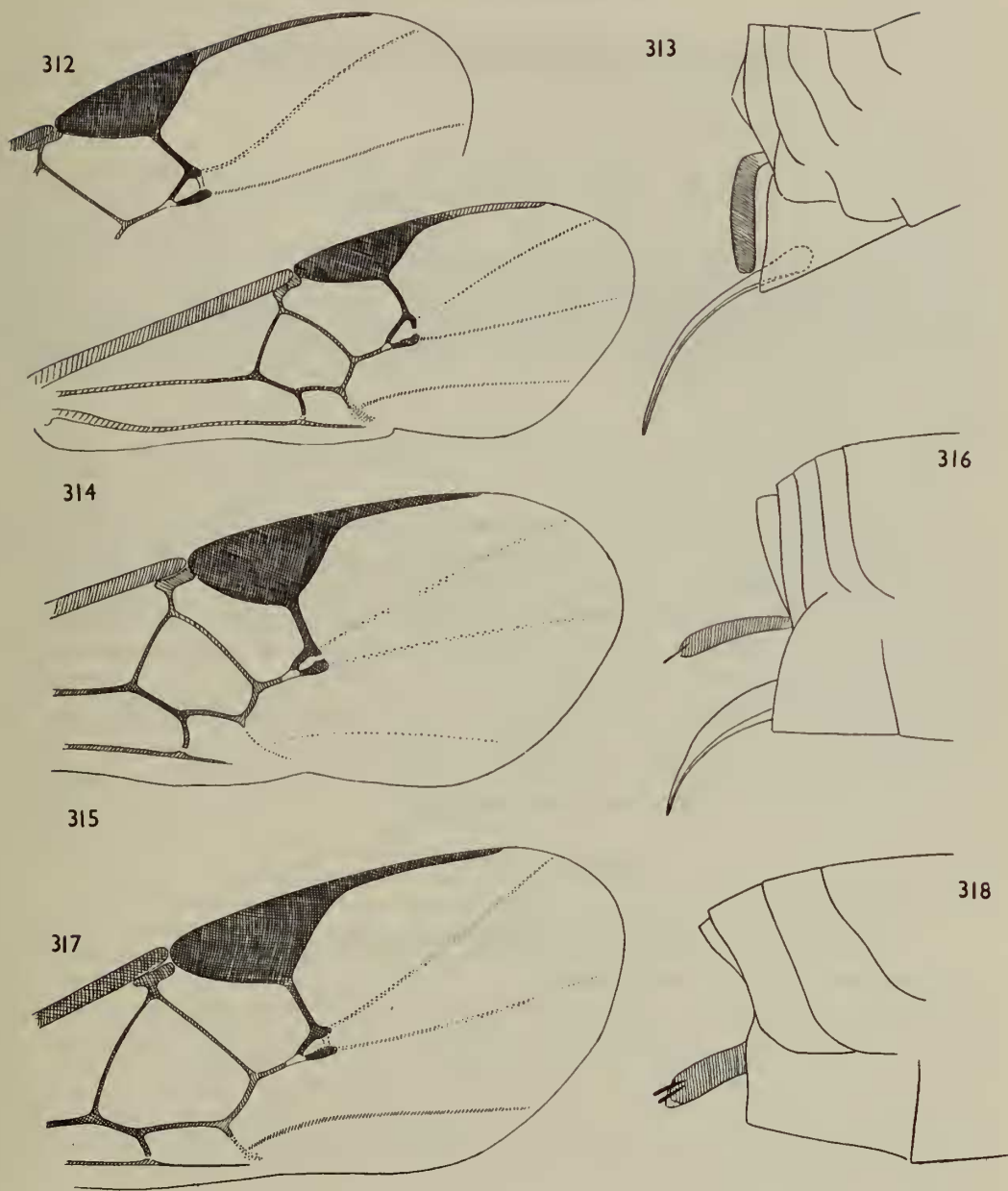
Protomicroplitis scotica (Marshall), **comb. n.**

⁵⁵*Microgaster auripes* Provancher, 1886 : 141 ; Muesebeck 1922 : 31

Protomicroplitis auripes (Provancher) **comb. n.**

⁵⁶*Microgaster facetosa* Weed, 1888 : 296.

Protomicroplitis facetosa (Weed) **comb. n.**



FIGS. 312-318. *Protomicroplitis*, ♀: 312, *connexus* (Nees), fore wing, part; 313, *scotica* (Marshall), ovipositor, lateral; 314, same, fore wing; 315, *spretus* (Marshall), fore wing, part; 316, *orontes* sp. n., ovipositor, lateral; 317, *calceatus* (Haliday), fore wing, part; 318, *hinzi* sp. n., ovipositor sheath.

THE *ABDOMINALIS*-GROUP

Monobasic.

***Protomicroplitis abdominalis* (Nees) comb. n.**

Microgaster abdominalis Nees, 1834 : 163.

Hygroplitis abdominalis (Nees) Lyle, 1918 : 130.

♀♂. This is a most distinctive species, easily recognised by the colour of the wings. The gaster is usually blackish in the male but tergite (2 + 3) is extensively pale marked (reddened) in the female.

Vertex between the ocelli and the eye-margin polished. Flagellum long, thick, pale at base and with the preapical segment fully twice as long as wide.

Mesoscutum shiny, very coarsely reticulate-punctate. Disc of scutellum strongly domed, coarsely punctate and separated from the mesoscutum by a wide, strongly costate furrow ; the posterior, polished band of the scutellum is widely interrupted at middle by a patch of rugosity. Radial cell abruptly narrowed apically (Text-fig. 324) ; 1st abscissa of the discoideus very distinctly shorter than the 2nd.

Tergite 1 is slightly transverse and has a deep, narrow, medial furrow. The short, almost hidden, ovipositor sheath shows a row of four fine, black setae, arising from the lower margin.

EUROPE. Occurs in England.

Lyle was probably deceived by the heavily rugose gaster of this species in believing it to be related to *russatus* Haliday and *rugulosus* Ns., the two species that constitute *Hygroplitis* ; *Hygroplitis* is treated as a synonym of *Microgaster* in this work.

The short 1st abscissa of the discoideus, the coarsely reticulate-punctate mesoscutum and the strongly domed disc of the scutellum with its posterior rugose are all absent in *Microgaster*. The fine setae that adorn the apex of the ovipositor sheath in *abdominalis* point to a relationship with *Protomicroplitis* but never occur in *Microgaster*.

Protomicroplitis abdominalis (Nees) is an extreme form whose position is perhaps midway between the *connexus*- and *scotica*-groups.

THE *ORONTES*-GROUP

Monobasic.

***Protomicroplitis orontes* sp. n.**

♀. Body entirely black. Legs very dark.

Frons and vertex polished. Posterior, transverse tangent to the anterior ocellus almost touching the posterior pair. Antenna about as long as the body, rather weak, with the preapical segment about one and a half times longer than wide.

Disc of scutellum very shiny and with only faint traces of superficial punctation. 1st abscissa of the discoideus as long as the 2nd ; 2nd transverse cubitus more or less interstitial with the 1st abscissa of the radius. Inner spur of the hind tibia only a little longer than the outer one but distinctly reaching beyond the middle of the hind basitarsus ; segment 5 of the front tarsus with a fine spine, very hard to see.

Tergite 1 about one and one third times longer than wide, deeply grooved on its anterior smooth, declivious part ; posteriorly its sides are gently rounded ; the short, posterior, horizontal surface is weakly rugose. The three fields of tergite 2 feebly roughened (Text-fig. 311). Ovipositor sheath with a single thickened seta at apex ; ovipositor considerably thickened towards base (Text-fig. 316). Length: ca. 2.5 mm.

EUROPE : Finland, Kuusamo, 1 ♀, the *TYPE*, (Frey), Novorossiisk, 1 ♀, (Luther). Type in Coll. Hellén.

Important for recognising this little species are the extremely fine sculpture of the mesoscutum and the form of tergite (2 + 3). I am at a loss to suggest close allies.

THE *SPRETUS*-GROUP

The group is essentially characterized by the short antenna of the female and the form of tergites 1 and (2 + 3).

The head, in a lateral view, is of characteristic shape (Text-fig. 325). Face more or less transversely striate-punctate. Mesoscutum shiny, strongly punctate to rugose-punctate but without microsculpture between the punctures ; disc of scutellum flattened, shiny, with or without widely spaced punctures. Hind coxa flattened on outer side. First abscissa of the radius placed at right angles to the stigma ; 1st abscissa of the discoideus as long as the 2nd.

KEY TO SPECIES

- 1 Gaster in greater part yellow ; hind coxa entirely yellow ; antenna less thick, with segments 10-12 about one and a half times longer than wide.

Flagellum without bristly pubescence ; mesoscutum very coarsely punctate, almost rugose-punctate ; disc of scutellum shiny, with large, scattered punctures ; its extreme tip with traces of fine rugosity interrupting the posterior, polished band of the scutellum ; inner spur of the hind tibia almost as long as the hind basitarsus ; propodeum with coarse rugosity ; metacarp about two and a half times as long as its distance from the apex of the radial cell ; stigma as in *austrina*

tomentosa (Wilkinson)⁵⁷

INDIA: Dehra Dun (type locality). Type in the British Museum (Nat. Hist.).

Host: The type series was recorded as parasitising a Pyralid defoliating *Terminalia tomentosa*. In B.M. (N.H.) is additional material bred from *Macalla* sp. (Pyralidae), defoliating *Tectona grandis*. A gregarious parasite.

- Gaster black or blackish ; hind coxa dark on at least posterior half ; antenna thick ; with segments 10-12 hardly longer than wide 2
- 2 Hind coxa black ; hind tibia very dark but with a faintly paler area just proximal to middle but not extending to base ; metacarp about one and one third times longer than its distance from the apex of the radial cell ; stigma broader (Text-fig. 315) ; disc of scutellum rugulose at extreme tip, its surface otherwise with widely separated punctures ; propodeum with a predominating sculpture of coarse punctation ; flagellum without bristly pubescence ; gaster (Text-fig. 319) *spretus* (Marshall)⁵⁸

EUROPE: Only specimens from England seen. Type presumably lost.

Host: *Dioryctria palumbella* F. (Kent, Dartford Heath, bred in May by R. L. E. Ford), *Euzophora consociella* Hübner (Phycitidae). A solitary parasite.

This species, as far as European Microgasterinae are concerned, is quite unmis-takeable.

- Hind coxa reddish yellow beyond middle ; hind tibia yellow on fully basal half ; meta-carp about three times as long as its distance from the apex of the radial cell ; stigma slightly less broad than in *spretus* (cf. Text-fig. 315) ; disc of scutellum polished at tip and its surface, otherwise, virtually impunctate ; propodeal sculpture not

⁵⁷*Microgaster tomentosa* Wilkinson, 1930 : 283.

Protomicroplitis tomentosa (Wilkinson) **comb. n.**

⁵⁸*Microgaster spretus* Marshall, 1885 : 259.

Protomicroplitis spretus (Marshall), **comb. n.**

resolvable as obvious punctation ; flagellum with bristly pubescence (Text-fig. 309).

Mesoscutum shiny and with large, on the whole well separated, punctures

austrina (Wilkinson)⁵⁹

S. AFRICA: Cape Province, Pondoland, Port St. John (type locality). Type in the British Museum (Nat. Hist.).

The series recorded as *austrina* by Wilkinson (1930 : 282), is a different species. The hind spurs of this species are shorter than in *spretus* and *tomentosa*.

THE *CALCEATUS*-GROUP

I include two species in this group ; they are perhaps less closely related than their external appearance suggests.

Ocelli not in a very low triangle, the posterior, transverse tangent to the anterior ocellus hardly touching the posterior pair. Mesoscutum very shiny, at most with fine punctation ; disc of the scutellum markedly convex ; posterior, polished band of the scutellum not in the least interrupted at middle by rugosity. Propodeum without trace of medial keel ; shiny but vaguely rugose-punctate. Tergites with fine hairs all over. Sheath of ovipositor without setiform appendages at tip.

In general habitus, the two species bear a striking resemblance to the *vitripennis*-group of *Apanteles*, especially with regard to the structure of the head and thorax and the sculpture of the mesoscutum and propodeum.

KEY TO SPECIES

FEMALES AND MALES

- A Hind femur and hind tibia infusate at apex ; phragma of the scutellum widely visible ; metacarp about four times as long as its distance from the apex of the radial cell (Text-fig. 317) ; spines of the outer side of the hind tibia fine, more erect, well separated, sparser *calceatus* (Haliday)⁶⁰

EUROPE. Type presumably in the Dublin Museum, Ireland.

Host: *Thera variata* Schiffermüller ; *Thera obeliscata* Hübner (Geometridae).

A solitary parasite, making a pale brown cocoon.

- B Hind femur and hind tibia entirely reddish-yellow ; phragma of the scutellum hidden ; metacarp about twice as long as its distance from the apex of the radial cell ; spines of the outer side of the hind tibia much thicker, less erect, more numerous and, to some extent, overlapping (Text-fig. 305).

1st discoidal cell distinctly smaller than in *calceatus* *circumvectus* (Lyle)⁶¹

EUROPE: England, New Forest (type locality) ; Finland. Type in the British Museum (Nat. Hist.).

Host: *Lobophora carpinata* Borkhausen (now *Nothopteryx*). (Geometridae). Solitary parasite making a very characteristic cocoon, dark brown in colour, shorter and more barrel-shaped than that of *calceatus*.

The mesoscutum is more shiny and more distinctly punctate in this species than in *calceatus* and the propodeum is shorter. The densely spinose hind tibia is a distinctive feature of this species.

⁵⁹*Microgaster austrina* Wilkinson, 1929 : 119.

Protomicroplitis austrina (Wilkinson) **comb. n.**

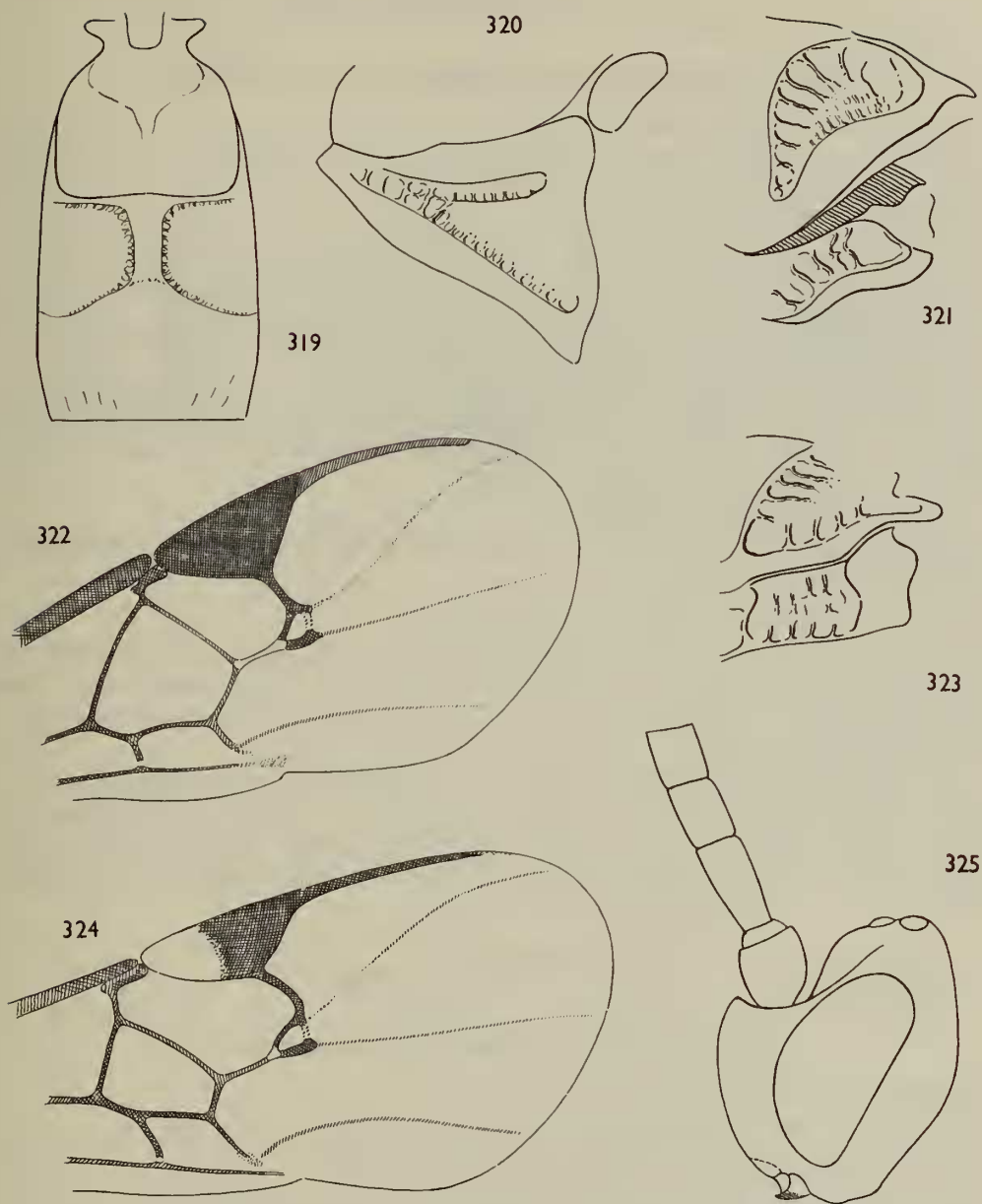
⁶⁰*Microgaster calceatus* Haliday, 1834 : 241.

Protomicroplitis calceatus (Haliday) **comb. n.**

⁶¹*Diolcogaster circumvectus* Lyle, 1918 : 105.

Microgaster circumvectus (Lyle) Fahringer, 1937 : 335.

Protomicroplitis circumvectus (Lyle) **comb. n.**



FIGS. 319-325. *Protomicroplitis*, ♀: 319, *spretus* (Marshall), basal tergites; 320, *schunkei* sp. n., side of pronotum; 321, *marginatus* (Nees), scutellum & postscutellum, (lateral) to show phragma (shaded) of scutellum; 322, same, fore wing, part; 323, *periander* sp. n., scutellum & postscutellum (lateral), (phragma of scutellum concealed); 324, *abdominalis* (Nees), fore wing, part; 325, *spretus* (Marshall), to show head (lateral) and basal flagellar segments.

THE *COENONYMPHAE*-GROUP

Monobasic.

***Protomicroplitis coenonymphae* (Watanabe) comb. n.**

Microgaster coenonymphae Watanabe, 1937 : 101.

♀. Head and thorax blackish ; gaster in greater part yellow-testaceous with infuscation across the tergites and within the hollowed out part of tergite 1. Hind coxa almost entirely, and the hind femur entirely, yellow-testaceous.

Face strongly shining, almost smooth. Frons and vertex polished. Ocelli in a rather low triangle, the posterior, transverse tangent to the anterior ocellus just cutting the posterior pair.

Mesoscutum polished, impunctate. Disc of scutellum strongly convex, polished ; posterior, polished band of the scutellum widely interrupted at middle by a patch of rugosity. Propodeum somewhat flattened, with much unevenly distributed rugosity and a strong, medial keel. First abscissa of the radius somewhat obliquely placed on the stigma.

Tergite 1 coarsely rugose, with short medial furrow that does not cut through the medial hump (Text-fig. 327). Tergite 2 with poorly defined, raised median field ; otherwise shiny and with vaguely defined pits and rugosities ; lateral field of tergite 2 transverse. Ovipositor sheath at tip without setiform appendages.

JAPAN : Tokyo, (type locality).

Type in Entomological Institute, (Hokkaido University). Two paratypes in British Museum (Nat. Hist.).

Host : *Coenonympha oedippus* F. (Satyridae).

This is an aberrant species. On the shape of the 2nd tergite and the short 1st abscissa of the discoideus it perhaps comes closest to the *connexus*-group. The completely smooth mesoscutum is a rare feature among the species-groups that I include in *Protomicroplitis*.

Behind the posterior polished band of the scutellum is a narrow, rugose groove—a part of the scutellum—that, in its extension inwards, is confluent with the patch of rugosity that interrupts the posterior, polished band. This sculptural feature occurs in species of the *xanthaspis*-group but I have not fully explored its taxonomic value.

THE *LEPELLEYI*-GROUP

Monobasic.

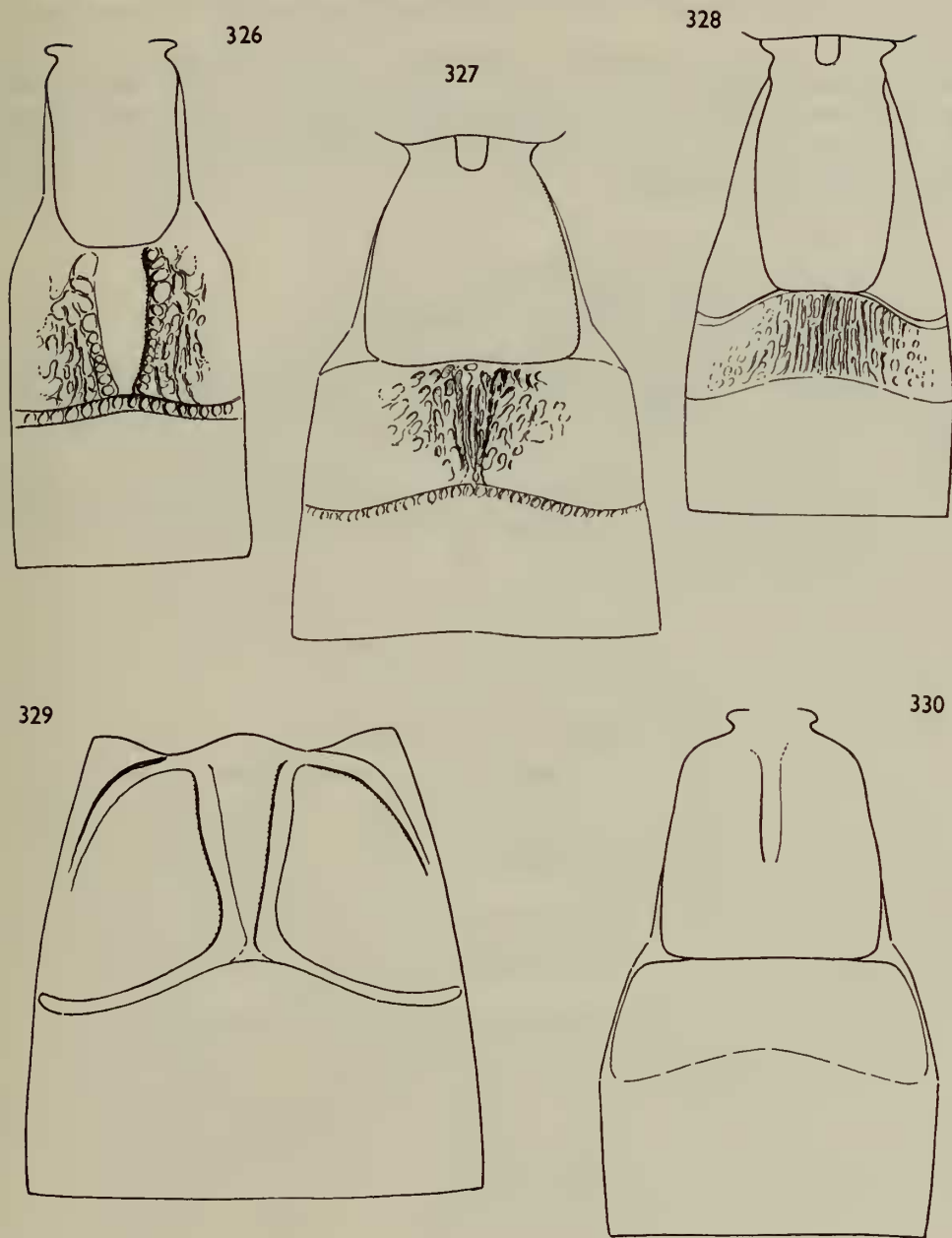
***Protomicroplitis lepelleyi* (Wilkinson) comb. n.**

Microgaster lepelleyi Wilkinson, 1934 : 118.

♀. Body in greater part blackish ; anterior corners of tergite (2 + 3) pale. Legs obscure brownish red with the hind coxa entirely dark. Wings hyaline.

Face dull, rugose-punctate. Frons and vertex dull, densely rugose-punctate. The highly polished occipital region is constricted on each side and sharply separated from the adjacent, rugose surface. Ocelli in rather a high triangle, the posterior transverse tangent to the anterior ocellus hardly touching the posterior pair. Antenna fully as long as the body, with the preapical segment twice as long as wide.

Mesoscutum dull, coarsely rugose-punctate ; the sculpture denser and finer anteriorly. Disc of scutellum not separated from the lateral, rugose areas ; the disc itself coarsely punctate, dull and sharply separated from the wide, polished, posterior band of the scutellum. Propodeum



FIGS. 326-330. Basal tergites of *Protomicroplitis*, ♀: 326, *facetosa* (Weed); 327, *coenonymphae* (Watanabe); 328, *connexus* (Nees); 329, *euterpe* sp. n., (tergite (2 + 3) only); 330, *schunkei* sp. n.

coarsely reticulate-rugose with at most a trace of a medial keel ; in most specimens the place of the keel is taken by broken reticulations. Wings (Text-fig. 306). Hind coxa coarsely rugose-punctate.

Tergite 1 nearly twice as long as wide, parallel-sided for most of its length but on its short horizontal surface narrowed (Text-fig. 296) ; its surface smooth throughout except for some rugosity at sides of apical turned over part. Tergite (2 + 3) having a smooth, polished appearance with a hardly indicated median field ; this field is hardly defined towards the almost obliterated second suture but tends to be slightly widened behind. Ovipositor sheath without a trace of apical setiform appendages.

Length: ca. 3 mm.

AFRICA : Kenya (type locality).

Type in the British Museum (Nat. Hist.).

Host : *Epigynopteryx ansorgei* Warren (Noctuidae).

This species is essentially characterized by the coarse, quite dull, sculpture of the head and thorax. The absolute break between the densely sculptured scutellar disc and the posterior, polished band of the scutellum is a striking feature of the group.

The group is isolated and restricted to Africa. There are several undescribed species in the British Museum and none of them is transitional towards any other species-group within *Protomicroplitis*.

THE *SCHUNKEI*-GROUP

Monobasic.

Protomicroplitis schunkei sp. n.

♀. Black ; gaster very dark brown with tergite (2 + 3) very slightly paler at sides. Front and middle legs entirely pale ; hind coxa black ; hind femur blackish virtually throughout ; hind tibia blackish but sharply pale on about basal two fifths ; hind tarsus blackish throughout except that the extreme base of the basitarsus is yellowish. Fore wing hyaline but a little darkened beyond the areolet.

Head above smooth, shiny with faint satin-like sheen. Face shiny but a little roughened. Ocelli in a very low triangle, the transverse, posterior tangent to the anterior ocellus cutting deeply into the posterior pair. Antenna rather thick with the preapical segment about three times as long as wide.

Mesoscutum distinctly punctate, the punctures hardly more crowded along the course of the notaulices ; the general surface is somewhat dull, especially along the lateral lobes because of a fine, scaly-reticulate sculpture between the fairly large punctures. Pronotum (Text-fig. 320). Disc of scutellum punctate ; towards sides rugose-punctate. Propodeum very shiny, almost smooth over a large part of its surface ; the medial keel very strong. Mesopleurum in far greater part smooth, polished ; anteriorly with only somewhat indistinct punctation. Hind spurs whitish yellow, the inner one fully three quarters as long as the hind basitarsus. Submedian cell without hairs ; 1st abscissa of the discoideus a little shorter than the 2nd ; metacarp fully three times as long as its distance from the apex of the radial cell ; radial cell markedly downcurved at apex (Text-fig. 333) ; vannal lobe slightly concave beyond its widest part and here without trace of projecting hairs.

Gaster (Text-fig. 330). Tergite 1 with deep, smooth medial furrow reaching the posterior horizontal part of the tergite. Apex of the ovipositor sheath without modified setae.

Length: 4 mm.

S. AMERICA : Peru, Chanchamayo, 13.vi.1949, 1 ♀, the *TYPE*, (*J. M. Schunke*). Type in the British Museum (Nat. Hist.).

This species seems to be isolated and I am at a loss to suggest close allies. In general habitus there is a marked resemblance to the species of the *scotica*-group and this is heightened by the shape of the first tergite and the sculpture of the mesoscutum. The unmodified second tergite together with the very small areolet help to isolate the species. The deep, sharply discrete, lateral pronotal furrow is a rare feature in *Protomicroplitis*.

THE *CALLIPTERA*-GROUP

Head, from in front, with wide transverse face ; above, polished, impunctate. Mouth opening very wide, the mandibles, in consequence, long (Text-fig. 332). Ocelli in a low triangle, the posterior, transverse tangent to the anterior ocellus just cutting the posterior pair.

Mesoscutum polished, impunctate or with very fine, sparse punctation. Propodeum short, very coarsely reticulate (very much like the propodeum of *Microplitis*) ; median keel present. Inner spur of the hind tibia much longer than half the basitarsus. Metacarp about one and a half times as long as its distance from the apex of the radial cell but its distal limit not clearly defined (Text-fig. 331). Hind coxa moderately large.

The median plate of tergite 1 of very characteristic appearance (Text-fig. 334).

At least the gaster and legs in far greater part bright reddish-yellow.

The two species belonging to this group represent typical *Protomicroplitis* and are a long way removed from the numerous species belonging to the *xanthaspis-fasciipennis* groups and such of their extensions as the *scolica*-, *spretus*- and *connexus*-groups. I have met with no species from the Old World that I consider to be closely related to the *calliptera*-group. In the New World, on the other hand, the *calliptera*-group seems to show some affinity with the *lelaps*-group but it is possible that I have been deceived here by a confusing example of convergence.

KEY TO SPECIES

- A Head and thorax black ; mesoscutum with a fine, sparse punctation ; mesopleurum sharply, discretely punctate in front ; face with slightly stronger rugosity in which striate elements are much in evidence.

Antenna longer than the body with the preapical segment of female three times as long as wide ; length: ca. 5 mm. (wings, Text-fig. 331) . . . *calliptera* (Say)⁶²

N. AMERICA. Type lost, according to Muesebeck, 1922.

Host: *Platysenta sutor* Guenée, *Platysenta videns* Guenée (Noctuidae).

My knowledge of this species is based on three females borrowed from Riksmuseum, Stockholm (Texas, *Belfrage*) and a female in the British Museum collection, also from Texas, bearing the label "*Microgaster maculipennis*". Muesebeck synonymised *maculipennis* with *calliptera* in 1922.

- B Head and thorax reddish yellow with only the propodeum infusate ; mesoscutum impunctate ; mesopleurum impunctate in front. Male . . . *mediatus* (Cresson)⁶³

CUBA. MEXICO. Type in the Academy of Sciences, Philadelphia.

I know this species from a single male from Cuba, Soledad, determined by Muesebeck.

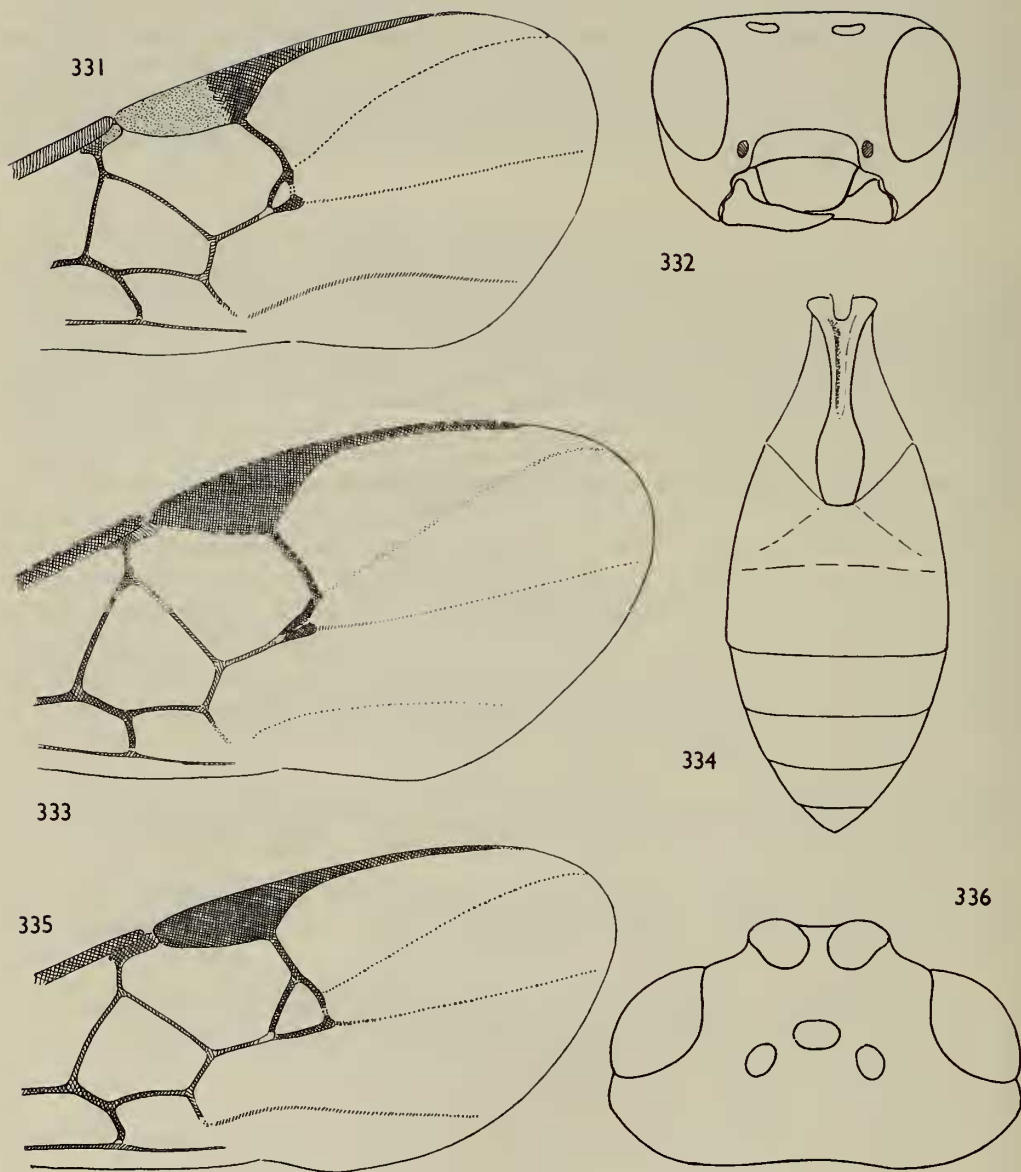
⁶²*Microgaster calliptera* Say, 1836 : 264.

Protomicroplitis calliptera (Say) **comb. n.**

⁶³*Microgaster mediatus* Cresson, 1865 : 66.

Microgaster mediatus Cresson ; Muesebeck, 1922 : 27.

Protomicroplitis mediatus (Cresson) Ashmead, 1900 : 292.



FIGS. 331-336. *Protomicroplitis*: 331, *calliptera* (Say), ♀, fore wing, part; 332, same, head, seen partly from below; 333, *schunkei* sp. n., ♀, fore wing, part; 334, *calliptera* (Say), ♀, gaster, dorsal; 335, *ippis* sp. n., ♂, fore wing, part; 336, same, head, from above.

THE *LELAPS*-GROUP

Black species with the hind coxa and the hind femur black. Wings hyaline. Head rather large, seen from above distinctly wider than the mesoscutum; seen from in front, like that of *calliptera* (cf. Text-fig. 332). Mouth opening wide, especially in *lelaps*. Ocelli in a low triangle, the posterior, transverse tangent to the anterior ocellus cutting the posterior pair.

KEY TO SPECIES

FEMALES

- A Vannal lobe beyond its widest part very slightly concave and here without projecting hairs; tergite 1 fully three times as long as wide, virtually parallel-sided; fore wing with dark apical cloud; metacarp about twice as long as its distance from the apex of the radial cell; tergite (2 + 3) with an elongate, parallel-sided basal field, open behind; surface on each side of this field yellow; ovipositor sheath with a fine modified apical seta; scape longer, yellowish as is also the basal part of the flagellum.

Mesoscutum and scutellum with unusually long, fine whitish pubescence; mesoscutum strongly shining and smooth except for minute, setiferous punctures; 1st abscissa of the discoideus very slightly shorter than the 2nd; disc of scutellum behind with a small group of punctures that hardly interrupts the posterior polished band; hind tibia blackish but whitish at extreme base; hind coxa large, closely covered with deep punctures, the interspaces very shiny. Length: ca. 5 mm.

lelaps sp. n.

MEXICO: Vera Cruz, Atoyac, 1 ♀, the TYPE, (Godman-Salvin). Type in the British Museum (Nat. Hist.).

- B Vannal lobe beyond its widest part straight and throughout with fringe of short hairs; tergite 1 at most two and a half times as long as wide, more rugose than in *lelaps* and with more sharply defined median groove on anterior two thirds; fore wing without an apical cloud; tergite 2 with two short, lateral furrows and with an elongate raised median field that is not delimited by these furrows; scape short, black, like the flagellum; tip of ovipositor sheath with a thickened hair that is not so sharply distinct as in *lelaps*; metacarp about two and a half times longer than its distance from the apex of the radial cell.

Mesoscutum very shiny, distinctly punctate, more especially in front, but the punctures fading out posteriorly; pubescence normal; 1st abscissa of the discoideus, as in *lelaps*, very slightly shorter than the 2nd; hind tibia infusate but becoming yellowish on about basal third; posterior tip of the scutellar disc rugose-punctate and completely interrupting the posterior, polished band of scutellum; hind coxa a little less evenly punctate than in *lelaps*; hind spurs yellow; in *lelaps* they are brown; length: ca. 4 mm.

duris sp. n.

MEXICO: Guerrero, Tepetlapa, 3,000 ft., vi. 1 ♀, the TYPE, (H. H. Smith), Guerrero, Chilpancingo, 4,600 ft., vi. 1 ♀, (H. H. Smith). Type in the British Museum (Nat. Hist.).

Both these species have the face distinctly transverse and the propodeum very coarsely reticulate-rugose.

THE *IPPIS*-GROUP

Monobasic.

Protomicroplitis ippis sp. n.

♂. Scape and fully basal half of flagellum bright yellowish-red. Legs predominantly dark; hind pair brownish black throughout, including the spurs; hind coxa blacker than the rest of the leg. Fore wing darkened at apex and with dark patch beneath stigma.

Head small, strongly transverse, appearing very small in relation to the strongly domed, rather massive thorax (Text-fig. 336).

Face a little higher than wide, rugose ; top of head and temples more or less transversely rugose-striate. Ocelli in a very low triangle.

Mesoscutum dull with large punctures along each side of the middle line, with the interspaces scaly-reticulate ; the notaulic courses are broadly rugose-reticulate ; pubescence of mesoscutum consisting of rather thick, closely adpressed brownish-golden hairs. Disc of scutellum strongly domed, especially in front, where it falls steeply to the wide, strongly costate furrow between itself and the mesoscutum ; dull, strongly rugose all over. Posterior, polished band of the scutellum widely interrupted at middle by an area of rugosity. Mesopleurum depressed below and here dull, densely rugose-reticulate. Wings (Text-fig. 335) ; submedian cell of fore wing without hairs ; vannal lobe small, strongly concave beyond its widest part and here without trace of a hair-fringe.

Sides of tergite 1 outside the long, narrow, median plate, and sides of tergite 2 pale, membranous.

Length: ca. 4.2 mm.

BRAZIL : Nova Teutonia, 25.iii.1936, 1 ♂, the *TYPE*, (*Plaumann*).

Type in the British Museum (Nat. Hist.).

A very remarkable and distinctive species, characterized to some extent by the unusually coarse sculpture of the large, hind coxa. Although the shape of the plate of tergite 1 approaches that of *lelaps* and the *calliptera*-group, I do not think that *ip̄pis* is related to these species. I am inclined to regard it rather as an aberrant offshoot in the *xanthaspis*-group line of descent.

XANTHOMICROGASTER Cameron gen. rev.

Xanthomicrogaster Cameron, 1911 : 325.

[= *Microgaster* Latreille ; Wilkinson, 1930 : 284].

The essential features of this genus, which seems distinct enough on the material available, lie in the shape of the gaster and the venation of the hind wing. On both these points it differs from *Hypomicrogaster*.

Mesoscutum polished and with only a fine, sparse punctation. Scutellum flattened, polished, impunctate ; lateral polished field only weakly convex in the anterior direction, so that the sunken area between itself and the disc gradually narrows from in front to behind. Inner spur of the hind tibia fully three quarters as long as the hind basitarsus ; spines of the outer side of the hind tibia long enough to give the tibia a prickly appearance. Tergite 2 separated from 3 by a deep furrow. Hypopygium short, evenly sclerotised all over. Ovipositor sheath fully two thirds as long as the hind tibia, clothed with long as well as short hairs.

KEY TO SPECIES

FEMALES AND MALES

- | | | |
|---|--|---|
| 1 | Males | 2 |
| — | Females | 3 |
| 2 | Body predominantly bright reddish yellow, with the mesosternum, propodeum, post-scutellum, underside of hind coxa and gaster posterior to tergite 2, blackened ; tergite 2 large, very coarsely rugose and together with 3 occupying almost the entire surface of the gaster beyond tergite 1 ; apical tergites very short and retracted beneath 3 ; stigma slightly narrower ; 1st abscissa of the radius slightly longer and more obliquely placed than in <i>pelides</i> (Text-figs. 344 and 345) <i>seres</i> sp. n. | |

MEXICO: Vera Cruz, Atoyac, V., 2 ♂♂, one the TYPE, (H. H. Smith).

- Body predominantly black but the head red ; tergite 1 almost yellow and a pale spot at the side of tergite 3 ; tergite 2 much less exaggerated in size and sculpture than in *seves* and, together with 3, not occupying the greater part of the gaster beyond tergite 1 ; apical tergites not short and not retracted noticeably beneath tergite 3
? pelides sp. n.

BRAZIL: Nova Teutonia, v. 1937, 1 ♂, (*Plaumann*) (see couplet 3).

- 3 Body and legs entirely honey-yellow ; stigma narrower, emitting the radius more obviously distal to middle ; abscissa 1 of the radius slightly longer and slightly curved ; tergite 2 less transverse, two and a half times as wide as long, its coarse but very superficial sculpture present only towards sides *fortipes* Cameron⁶⁴

BRITISH GUIANA. Only type female seen ; in British Museum (Nat. Hist.).

- Thorax at least in part, and the hind coxa entirely, black ; stigma wider, emitting the radius less obviously distal to middle ; abscissa 1 of the radius slightly shorter and virtually straight ; tergite 2 more transverse, fully three times as wide as long, its sculpture finer, denser, and more extensive than in *fortipes*.

Head, except for the ocellar triangle and a dark patch behind the antennal insertions, and the mesoscutum, except for a dark patch in front, red ; hind femur almost yellow, except for a dark apical tip ; hind tibia more reddish than its femur ; tergite 1 obscure testaceous and contrasting with the black 2nd tergite ; gaster (Text-fig. 338) *pelides* sp. n.

BRAZIL: Nova Teutonia, viii.1935, 1 ♀, the TYPE, (*Plaumann*). Type in the British Museum.

BULUKA de Saeger

Monobasic.

Buluka de Saeger, 1948 : 64.

I have no doubt that I have correctly recognised this genus ; de Saeger has given an excellent figure of it.

The genus is remarkable only because of the structure of the gaster and certainly belongs to the Microgasterinae and not to the Sigalphinae in which subfamily de Saeger, while fully aware of its Microgasterine features, put it.

In my opinion *Buluka* is not far removed from *Protomicroplitis* in its widest sense and, within this genus, shows affinity perhaps with the *connexus*-group because of the smooth vertex and temples and the shortness of the first abscissa of the discoideus.

There are two males in the British Museum collection that I have provisionally identified as *Buluka straeleni*.

Buluka straeleni de Saeger

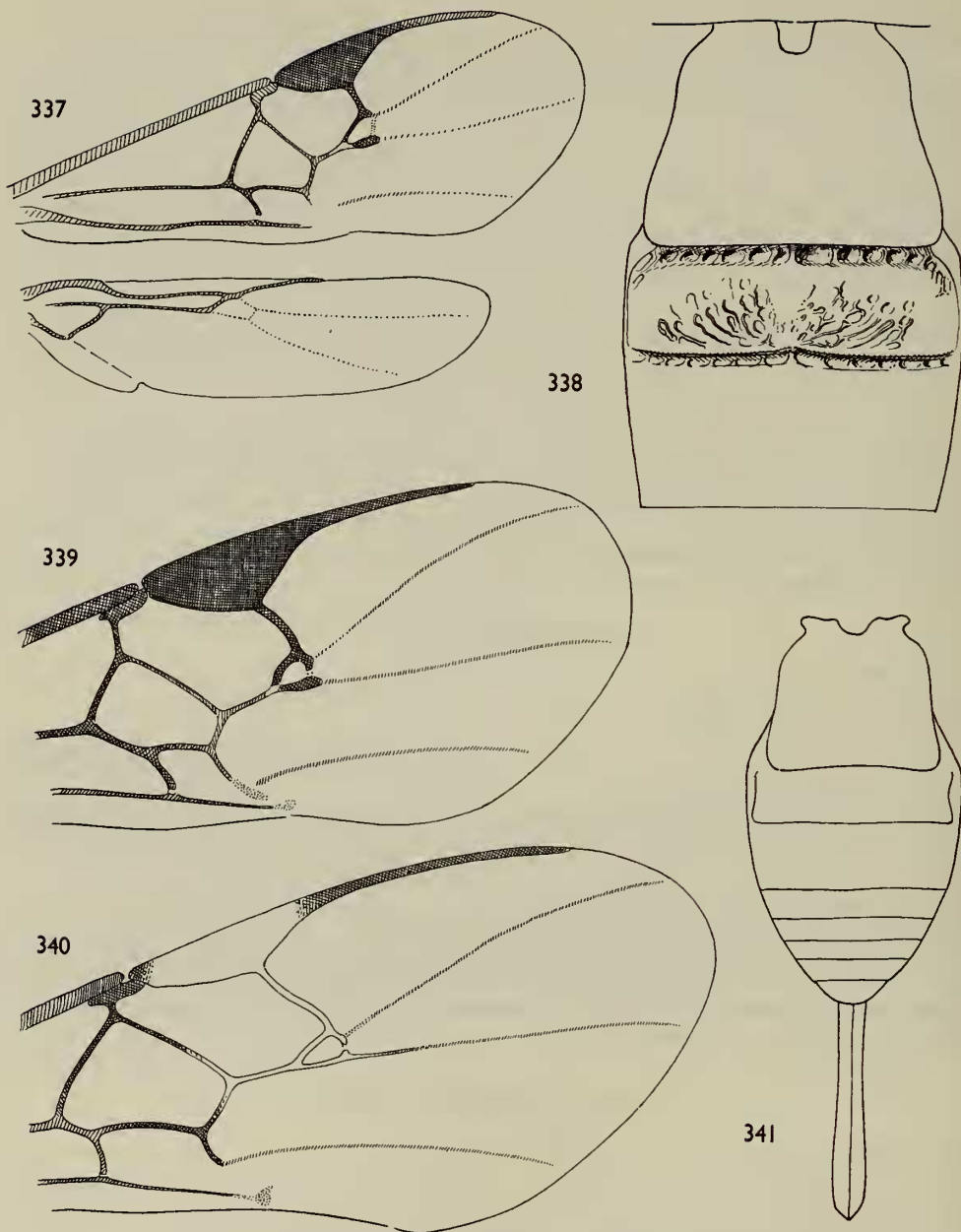
Buluka straeleni de Saeger, 1948 : 65.

♂. Front and middle legs entirely yellow ; hind tibia yellow on about apical half ; hind femur dark brown virtually throughout. Fore wing crossed by a dark band beneath the stigma ; this band is darker on the stigma side of the wing. Two basal tergites yellow.

Head above smooth, shining, with faint satin-like sheen. Ocelli in a low triangle. Apical segment of labial palpus fully as long as the two preceding segments together.

Mesoscutum dull, densely and evenly rugose-punctate to reticulate-punctate posteriorly. Disc of scutellum dull, densely reticulate-punctate, its rugose tip interrupting the posterior,

⁶⁴*Xanthomicrogaster fortipes* Cameron 1911: 325.



FIGS. 337-341. 337, *Buluka straeleni* de Saeger, ♂, wings; 338, *Xanthomicrogaster pelides* sp. n., ♀, basal tergites; 339, *Microgaster curvicrus* Thomson, ♀, fore wing, part; 340, *Larissimus cassander* sp. n., ♀, fore wing, part; 341, *Microgaster curvicrus* Thomson, ♀, gaster, dorsal.

polished band of the scutellum. Propodeum dull and showing a sculpture very similar to that of the scutellar disc ; median keel very poorly defined ; de Saeger describes the propodeum as divided by a "strong carina". Hind wing narrow ; metacarp of the fore wing about three times as long as its distance from the apex of the radial cell (Text-fig. 337). Spines of the outer side of the hind tibia somewhat fine and not dense enough to give the tibia a markedly prickly appearance.

Gaster rugose all over. Tergite 2 without trace of a median, basal field. In appearance the gaster is like that of the subfamily Cheloninae except that it is articulated between tergite 1 and 2 and the 2nd suture is deep and well marked.

BELGIAN CONGO : Rutshuri (type locality). S. AFRICA : Pondoland, Port St. John, v., 2 ♂♂, (*R. E. Turner*), in British Museum (Nat. Hist.).

Type in the Congo Museum, Tervuren.

MICROGASTER Latreille

Microgaster Latreille 1802 : 339.

Hygroplitis Thomson, 1895 : 2244 [Muesebeck and Walkley, in Muesebeck, Krombein & Townes 1951 : 135]

Type-species : *Ichneumon deprimator*.⁶⁵ Designated by Latreille, 1810 : 436.

This genus, as I now restrict it, contains only those heavily built species which, in temperate regions at any rate, have formed its typical representatives.

The essential characters of *Microgaster* s.str. have been given in the key (Text-figs. 339 and 341). The 1st abscissa of the discoideus is fully equal to the 2nd.

Taxonomically, *Microgaster* is in a state of confusion and, with regard to the European species, there has been no improvement on Thomson's treatment of the genus.

PHILOPLITIS gen. n.

Type-species : *Philoplitis coniferens* sp.n. Monobasic.

Mesoscutum strongly, evenly rugose ; notaulices deep, well defined. Scutellum prolonged backwards in the form of a long cone (Text-fig. 234) that is extremely coarsely rugose-reticulate ; the ridges of the reticulations are strongly raised so that the meshes appear very deep. A dark cloud beneath the rather wide stigma. Inner spur of the hind tibia reaching slightly beyond the middle of the hind basitarsus ; outer side of the hind tibia with sparse, fine, adpressed spines as in *Microplitis*.

Philoplitis coniferens sp. n.

♀. Hind femur and hind tibia blackish or very dark brown throughout. Except for the dark cloud beneath the stigma which is very variable in intensity, the wings are only very faintly darkened.

Except for a small, shiny, median excavation, the head behind the ocelli and eyes is densely rugose, the rugose area as long behind the ocelli as it is behind the temples and bounded against the occiput by a raised margin. Frons with shiny, even, transverse striation. Propodeum somewhat flattened, with strong, medial keel. Plate of tergite 1 three times as long as wide, virtually parallel-sided and finely rugulose-aciculate, especially towards posterior end.

Length: ca. 3.5 mm.

⁶⁵*Ichneumon deprimator* Fabricius 1798 : 227.

Microgaster deprimator (Fabricius) Latreille 1805 : 190.

PHILIPPINES : Los Baños, 4 ♂♂, 1 ♀♀, (one ♀, the *TYPE*) ; Mindañao, Dapitan, 1 ♂ ; Kolambugan, 1 ♀. (All *Baker*) ; Panganasinan, Sta. Barbara, 3.ii.1953, 1 ♂, (*H. & M. Townes*).

Type in the U.S. National Museum.

This genus differs from *Microplitis* on shape of scutellum, length of inner spur of hind tibia and presence of occipital margin.

ALLOPLITIS gen. n.

Type-species : *Alloplitis guapo* sp.n.

I have erected this genus for two species that are not at all closely related but differ from all species of *Microplitis* known to me on the structure of tergite (2 + 3). The shape of this tergite has been described in the key and is shown in figure 241. This character, in combination with a curious propodeal structure which (though different in the two species) is not found in *Microplitis*, provides enough justification, I think, for the use of a new generic name.

The ocelli are in a low triangle, the posterior, transverse tangent to the anterior ocellus cutting the posterior pair. The hind tibia is markedly swollen and its outer surface shows hardly a trace of differentiated spines ; this last is a typical feature of *Microplitis* and a swollen hind tibia is found in many exotic species of the genus ; inner spur of the hind tibia not reaching beyond the middle of the hind basitarsus. The areolet of the fore wing is weakly four-sided.

Altogether *Alloplitis* has much more in common with *Microplitis*, *Philoplitis* and *Snellenius* than with any of the species-groups that I have assigned to *Protomicroplitis*.

KEY TO SPECIES

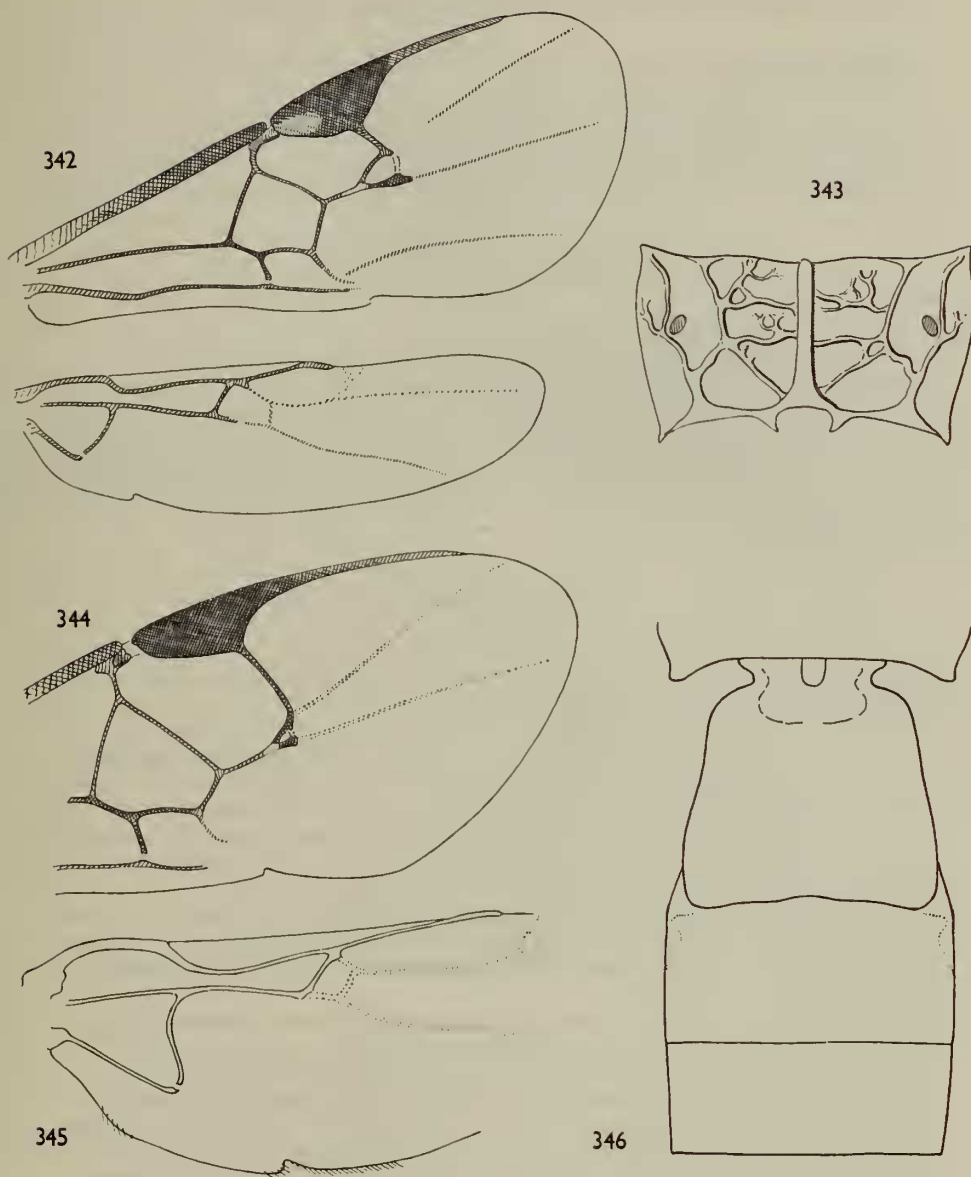
- A Tergite 3 rugose and about half as long as 2 (Text-fig. 241) ; frons shiny and with deep, subconfluent punctation ; metacarp about two and a half times longer than its distance from the apex of the radial cell ; (Text-fig. 240) tergite 1 strongly rugose, slightly widened apically, black but yellow within a deep, basal excavation ; propodeum with a medial keel that forks posteriorly to form a short, elongate fovea ; no trace of laterally directed costulae ; inner spur of the hind tibia hardly one third as long as the hind basitarsus ; hind tarsus as long as its tibia ; flagellum fairly slender, the preapical segment fully twice as long as wide.

Antenna, all the coxae and femora, except the hind femur at apex, yellowish ; length: 3 mm. *guapo* sp. n.

PHILIPPINES: Luzon, Mt. Makiling, 3 ♀♀, one the *TYPE*, (*Baker*). Type in the U.S. National Museum.

This species is essentially characterized by the long metacarp and the rugosity of tergite 3, that is, the apical part of tergite (2 + 3).

- B Tergite 3 smooth, shining and only slightly shorter than 2 : frons shiny as in *guapo* but fairly evenly striate right across ; metacarp shorter, hardly twice as long as its distance from the apex of the radial cell ; tergite 1 finely, evenly rugose, with a shallower basal excavation that is dark like the rest of the segment ; propodeum without a medial keel but with an ill defined V-shaped areola that is closed above by a strong keel ; this keel extends laterally as far as the lateral, propodeal keel ; propodeal spiracle enclosed within keels ; hind tarsus slightly shorter than its tibia ; hind tibia stouter than in *guapo*, its inner spur about half as long as the hind basitarsus ; flagellum almost reddish yellow in apical half, short, somewhat thickened



FIGS. 342-346. 342, *Microplitis mediator* Haliday, ♀, wings; 343, *Apanteles daira* sp. n., ♂, propodeum; 344, *Xanthomicrogaster seres* sp. n., ♂, fore wing, part; 345, same, hind wing, part; 346, *Apanteles schoenobii* Wilkinson, ♀, basal tergites.

in apical half, the segments here tightly articulated ; preapical segment about one and one third times longer than wide.

Hind coxa dark brown ; hind femur evenly reddish ; length: ca. 2.2 mm.

typhon sp. n.

PHILIPPINES: Luzon, Mt. Makiling, 1 ♀, the *TYPE*, (*Baker*). Type in the U.S. National Museum.

As already implied, there is no possibility of confusing this species with *guapo*. In addition to the differences given above, *typhon* has the stigma shorter, wider and less narrowed apically (cf. Text-fig. 240) ; the punctation of the temples and occipital region is denser, less coarse and with the surface duller than in *guapo*.

SNELLENIUS Westwood

Snellenius Westwood, 1882 : 19.

Type-species : *Snellenius vollenhovii* Westwood.

Muesebeck (1931) was the first to place this genus in the Microgasterinae and to point out its relationship with *Microplitis*. I have no hesitation in supporting his conclusions and consider *Snellenius* to be more closely related to *Microplitis* than to any other genus of the Microgasterinae. Indeed, I have not been able to find a sharp line of division between the two genera. The differences given in the key seem to be the only ones of value.

KEY TO SPECIES

FEMALES

- 1 Disc of scutellum reduced to a small, blunt, erect cone ; flagellar segments very strongly flattened, the middle segments slightly wider than long.

Virtually black species with the gaster whitish-yellow to sides of tergites 1 and 2 ; sides of thorax dusky red ; wings dark brown with a hyaline spot just proximal to the areolet ; radial cell narrower than in any other species of the genus ; 2nd transverse cubitus meeting the radius virtually at junction of radius and 1st transverse cubitus ; tergite 1 about three and a half times as long as wide, smoothly hollowed out like a trough almost to apex ; length: ca. 8 mm. *vollenhovii* Westwood⁶⁶

NEW GUINEA. 1 ♂, 1 ♀ in British Museum (Nat. Hist.).

- Disc of scutellum without such a cone, flattened, with deep excavations and strong, lateral margin (less strong and less characteristic in *theretrae*) ; flagellar segments never as flattened as this and the middle segments seen at their flattest always considerably longer than wide 2
- 2 Thorax predominantly bright fulvous, only the propodeum and metapleurum being somewhat infusate ; notaulices shallow, poorly defined and without rugosity ; middle lobe of the mesoscutum hardly raised as a shield.

Head blackish ; gaster blackish in apical half but extensively whitish-yellow beneath and to sides of tergites 1 and 2 and across apex of 3 ; fore wing in greater part brownish but with the median cell hyaline in the single ♀ but brownish in the two ♂ examined ; a darker cloud beneath the stigma in both sexes is flanked by paler subhyaline areas ; 2nd transverse cubitus meeting the radius far distal to the junction of the radius and the 1st transverse cubitus, the areolet hence large

radicalis (Wilkinson)⁶⁷

⁶⁶*Snellenius vollenhovii* Westwood, 1882 : 19.

⁶⁷*Microplitis radicalis* Wilkinson, 1929b : 206.
Snellenius radicalis (Wilkinson) 1934 : 120.

CHINA. Type in British Museum (Nat. Hist.).

The disc of the scutellum is strongly margined laterally and is divided by irregular keels into a number of rather deep excavations. The flagellar segments are only weakly flattened.

- Thorax blackish or dusky reddish-black ; notaulices deep and rugose ; middle lobe of the mesoscutum strongly raised above the lateral lobes and terminating behind in a fine keel that separates the two posterior troughs of the notaulices 3
- 3 Propodeum so coarsely reticulate that the sculpture consists of deep excavations surrounded by strongly raised keels ; between the medial longitudinal keel and the lateral keel not more than 3-4 such excavations can be counted in a transverse row ; middle lobe of the mesoscutum very strongly raised ; tergite 1 about three times as long as its apical width ; thorax more or less dusky reddish-black.

Temples decidedly rugulose ; species approaching *vollenhovii* in general habitus and coarseness of sculpture 4

- Propodeum less coarsely reticulate but more densely so, the number of reticulations on the dorsal surface between the medial keel and the lateral margin much more numerous when counted along a transverse row ; middle lobe of the mesoscutum less strongly raised, the notaulices shallower ; tergite 1 only slightly more than twice as long as its apical width ; thorax deep black.

Wings very dark brown ; in general reduction of sculpture, this species is much more like strongly sculptured species of *Microplitis* than *Snellenius*

theretrae (Watanabe)⁶⁸

JAPAN. Only 1 male seen, a paratype, in British Museum (Nat. Hist.).

Host: *Theretra nessus* Drury ; cocoon apparently dark brown with ribbing.

- 4 Head from above deeply emarginate between the almost angular corners of the temples ; fore wing almost hyaline but darkened beyond the areolet and with a still darker cloud beneath the stigma ; scutellar hollows unusually large, slightly longer than wide, flowing together behind the medial keel and here margined on each side by a thick, strongly raised keel ; mesopleurum beneath the wing insertions with deeper excavations.

Hind femur with well developed inner keel on apical two fifths

philippinensis (Ashmead)⁶⁹

BORNEO: Kuching. One male and one female of *bimaculatus* in British Museum (Nat. Hist.), both labelled type. The male has the head slightly less excavate behind the eyes than the female. The antenna is broken in both specimens.

- Head from above only very weakly emarginate, the corners of the temples not at all prominent ; fore wing dark brown ; scutellar hollows deep but slightly transverse and not flowing together behind and without the raised keel on each side seen in *philippinensis* ; mesopleurum beneath the wing insertions with smaller, shallower excavations.

Tergite 1 behind without the V-shaped area that occurs at the apex of the tergite in *philippinensis* ; flagellar segments feebly flattened ; middle lobe of the mesoscutum, considered without the long, sharp, posterior keel, almost truncate behind ; in *philippinensis*, the posterior keel forms merely a sharply pointed extension of the middle lobe ; further, the middle lobe in *gelleus* is deeply, longitudinally hollowed out on each side of a raised, medial thickening ; inner side of hind femur with well developed keel on apical two fifths *gelleus* sp. n.

CHINA: Foochow, 1935-36, 1 ♀, the TYPE, (M. S. Yang). Type in the British Museum (Nat. Hist.).

⁶⁸*Microplitis theretrae* Watanabe, 1937 : 108.

Snellenius theretrae (Watanabe) **comb. n.**

⁶⁹*Microplitis philippinensis* Ashmead, 1904 : 20.

Microplitis bimaculatus Cameron ; Wilkinson, 1930 : 24.

Snellenius philippinensis (Ashmead) Muesebeck, 1931 : 10.

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